1-1963

1963-1964 Bulletin

THE GRADUATE BULLETIN

1963-1964

University of Dayton

For more detailed information on any program, write to the proper Dean:

Very Rev. John A. Elbert, S.M.
Graduate Dean of Arts and Sciences
St. Mary's Hall—Room 204
Ext. 317

Office hours:
Monday through Friday—
8:00 a.m. to 12:00 p.m.
1:00 p.m. to 4:00 p.m.

Dr. Louis J. Faerber, S.M.
Dean of Education
Chaminade Hall—Room 213
Ext. 333

Office hours:
Monday through Thursday—
12:00 p.m. to 9:30 p.m.
Saturday—
8:00 a.m. to 12:30 p.m.

Dr. Maurice R. Graney
Dean of Engineering
St. Mary's Hall—Room 201
Ext. 217

Office hours:
Monday through Friday—
8:00 a.m. to 12:00 p.m.
1:00 p.m. to 4:00 p.m.

THE UNIVERSITY OF DAYTON
Dayton, Ohio

THE GRADUATE BULLETIN

Information
and
Announcements
1963-64

Graduate School of Arts and Sciences
School of Education
School of Engineering

Entered as second class matter July 15, 1918, at the Post Office at Dayton, Ohio, under Act of August 24, 1912.

TABLE OF CONTENTS

ACADEMIC CALENDAR

1963 - 1964

FIRST TERM

August	26....Monday	Registration (6:00 p.m.-9:00 p.m.)
August	27....Tuesday	Registration (6:00 p.m.-9:00 p.m.)
August	30....Friday	Day and Evening classes begin.
September	5....Thursday	Last day for late registration.
September	7....Saturday	Last day for change in schedules.
September	12....Thursday	Last day for withdrawal without record.
November	1....Friday	Feast of All Saints (no classes).
November	9....Saturday	Teacher Education Examination Program. (Application to be filed at least two weeks in advance.)
November	16....Saturday	Graduate Record Examinations. (Application should be filed at least two weeks in advance.)
November	27....Wednesday	Thanksgiving recess begins after last class.
December	2....Monday	Classes resume.
December	20....Friday	Term ends after last class.

SECOND TERM

January	6....Monday	Registration (6:00 p.m.-9:00 p.m.)
January	7....Tuesday	Classes begin.
January	14....Tuesday	Last day for late registration.
January	16....Thursday	Last day for change in schedules.
January	18....Saturday	Teacher Education Examination Program.
January	18....Saturday	Graduate Record Examinations. (Application to be filed at least two weeks in advance.)
January	21....Tuesday	Last day to withdraw without record.
March	24....Tuesday	Easter recess begins after last evening class.
April	1....Monday	All classes resume.
April	18....Saturday	Teacher Education Examination Program. (Applications to be filed at least two weeks in advance.)
April	25....Saturday	Graduate Record Examinations. (Applications to be filed at least two weeks in advance.)
May	1....Friday	Term ends after last evening class.
May	3....Sunday	Graduation Exercises.

ACADEMIC CALENDAR

THIRD TERM (First Half)

May	4....Monday	Registration (6:00 p.m.-9:00 p.m.)
May	5....Tuesday	All classes begin.
May	7....Thursday	Ascension Thursday (no classes).
May	9....Saturday	Last day for late registration.
May	11....Monday	Last day for change in schedules.
May	12....Tuesday	Last day to withdraw without record.
May	16....Saturday	Teacher Education Examination Program. (Applications to be filed at least two weeks in advance.)
June	27....Saturday	Term ends after last class.

PRE-SUMMER SPECIAL SESSIONS

June	6....Saturday	Registration for Pre-Summer Special Sessions.
June	8-26....	Three credit hour Workshops and Courses.
June	15-26....	Two credit hour Workshops and Courses.

SIX-WEEK SUMMER SESSION

June	27....Saturday	Registration for Regular Summer Session.
June	29 to August 7	Regular Summer Classes.
July	11....Saturday	Graduate Record Examination. (Applications to be filed at least two weeks in advance.)
July	11....Saturday	Teacher Education Examination Program.

POST-SUMMER SPECIAL SESSIONS

August	8....Saturday	Registration for Post-Session.
August	10-21....	Two credit hour Workshops and Courses.

FIRST TERM—1964-65

August	25-26....	Registration for First Term—1964-65.
August	29....Saturday	Classes begin at 8:00 a.m.

PERSONNEL

GOVERNING BODIES

Board of Trustees

Very Rev. James M. Darby, S.M., *Chairman*
Very Rev. John A. Elbert, S.M.
Jerome A. McAvoy, S.M.
John J. Jansen, S.M.
Very Rev. Raymond A. Roesch, S.M., *Secretary*

Associate Board of Lay Trustees

Milfred A. Spayd, *President*
Louis J. Wozar, *Vice President*
Merle P. Smith, *Secretary*
Isaac H. Jones, *Treasurer*
Stanley C. Allyn
Edwin G. Becker
James M. Cox, Jr.
Harry F. Finke, Sr.
Samuel L. Finn
Huber W. Gillaugh
Clarence H. Gosiger
Carroll A. Hochwalt
William H. Kuntz
Herman F. Lehman
Kenneth C. Long
Eugene A. Mayl
Robert S. Oelman
Louis F. Polk
Walter A. Reiling
David L. Rike
Mason M. Roberts
James M. Stuart
Dwight E. Young
Very Rev. James M. Darby, S.M.
Francis J. Perko, S.M.
Very Rev. Raymond A. Roesch, S.M.

Administrative Council

Very Rev. Raymond A. Roesch, S.M., *Chairman*
Rev. George B. Barrett, S.M.
Rev. Charles L. Collins, S.M.
Louis J. Faerber, S.M.
Austin J. Holian, S.M.
Elmer C. Lackner, S.M.
Francis J. Perko, S.M.
Rev. Thomas A. Stanley, S.M.

Academic Council

Rev. Thomas A. Stanley, S.M., *Chairman*
Very Rev. John A. Elbert, S.M.
Louis J. Faerber, S.M.
Maurice R. Graney
William J. Hoben, Jr.
Leonard A. Mann, S.M.
Donald C. Metz
Raymond Nartker, S.M.
John B. Steinbruegge

Administrative Officers

VERY REV. RAYMOND A. ROESCH, S.M. ..... *President*
REV. GEORGE B. BARRETT, S.M. ..... *Vice-President*
REV. THOMAS A. STANLEY, S.M. ..... *Dean of the University*
REV. CHARLES L. COLLINS, S.M. ..... *Dean of Students*
ELMER C. LACKNER, S.M. ..... *Assistant to the President*
VERY REV. JOHN A. ELBERT, S.M. ..... *Dean, Graduate School of Arts and Sciences*
MAURICE R. GRANEY ..... *Dean, School of Engineering*
WILLIAM J. HOBEN, JR. ..... *Acting Dean, School of Business Administration*
LOUIS J. FAERBER, S.M. ..... *Dean, School of Education*
LEONARD A. MANN, S.M. ..... *Dean, College of Arts and Sciences*
DONALD C. METZ ..... *Director of Technical Institute*
THOMAS J. POWERS, S.M. ..... *Associate Dean, School of Education*
STEPHEN I. SHEEHY, S.M. ..... *Dean of Men*

R. KATHLEEN WHETRO ..... *Dean of Women*
JOHN J. DRERUP, S.M. ..... *Registrar*
RAYMOND NARTKER, S.M. ..... *Librarian*
JOHN B. STEINBRUEGGE ..... *Director of Special Sessions*
ROBERT E. DONOVAN ..... *Assistant Director, Summer & Evening Sessions*
REV. ANDREW L. SEEBOLD, S.M. ..... *Administrative Director, Guidance Center*
REV. PAUL J. WAGNER, S.M. ..... *Chaplain*
FRANCIS J. PERKO, S.M. ..... *Business Manager*

COMMITTEES

Graduate Committee of the Academic Council

Maurice R. Graney, *Chairman*
Very Rev. John A. Elbert, S.M. Louis J. Faerber, S.M.
Rev. Thomas A. Stanley, S.M., *ex officio*

Graduate Committee of Arts and Sciences

Very Rev. John A. Elbert, S.M., *Chairman*
Cletus C. Chudd, S.M. Leonard A. Mann, S.M.
Rev. Matthew F. Kohmescher, S.M. Rev. Edmund Rhodes, S.M.
Paul P. Machowicz, S.M. Kenneth C. Schraut
Wilfred J. Steiner

Graduate Committee of the School of Education

Louis J. Faerber, S.M., *Chairman*
Sister M. Audrey Bourgeois, C.PP.S. John Emling, S.M.
Thomas C. Campanelle Ellis A. Joseph
Simon Chavez Daniel L. Leary

School of Engineering Graduate Study Committee

Robert A. Thomson, S.M., *Chairman*
Merle D. Schmid Bernhard M. Schmidt
Jesse H. Wilder Max S. Willis

GRADUATE STAFF

GLADYS M. ANDERSON, M.A., *Education*
STANLEY BACK, M.S., *Mathematics*
RICHARD R. BAKER, PH.D., *Philosophy*
EULALIO BALTAZAR, PH.D., *Philosophy*
ALFRED J. BANNAN, M.A., *History*
REV. GEORGE B. BARRETT, S.M., PH.D., *Education*
ERVING E. BEAUREGARD, M.A., *History*
BERNARD J. BEDARD, PH.D., *English*
WILLIAM BEITZEL, M.A., *Education*
MICHAEL A. BOBAL, PH.D., *Engineering*
SISTER M. AUDREY BOURGEOIS, C.PP.S., PH.D., *Education*
REV. CHARLES J. BRADY, S.M., S.T.D., *Theology*
THOMAS C. CAMPANELLE, PH.D., *Education*
SIMON J. CHAVEZ, ED.,D., *Education*
CLETUS C. CHUDD, S.M., PH.D., *Chemistry*
REV. WILLIAM J. COLE, S.M., S.T.D., *Theology*
KENNETH CRIM, PH.D., *Education*
JOSEPH DIESKA, PH.D., *Philosophy*
REV. RICHARD DOMBRO, S.M., PH.D., *Philosophy*
ROCCO M. DONATELLI, M.A., *History*
THOMAS A. DWYER, S.M., PH.D., *Mathematics*
ORMAN R. EDGINGTON, PH.D., *Education*
LEROY J. EID, S.M., PH.D., *History*

VERY REV. JOHN A. ELBERT, S.M., PH.D., *Philosophy*
JOHN F. EMLING, S.M., ED.D., *Education*
MARTINUS H. ESSER, PH.D., *Mathematics*
SYLVESTER EVESLAGE, PH.D., *Chemistry*
LOUIS J. FAERBER, S.M., PH.D., *Education*
CON J. FECHER, PH.D., *Economics*
MARGARET W. GALLICO, M.A., *Psychology*
EDWARD W. HARKENRIDER, PH.D., *Philosophy*
DANIEL J. HIGGINS, PH.D., *Biology*
REV. PHILIP HOELLE, S.M., PH.D., *Theology*
LAWRENCE A. JEHN, M.A., *Mathematics*
RUSSELL A. JOLY, S.M., M.S., *Biology*
ELLIS A. JOSEPH, PH.D., *Education*
DAVID KARL, PH.D., *Chemistry*
BERNARD KATCHMAN, PH.,D., *Chemistry*
CHARLES L. KELLER, PH.D., *Mathematics*
REV. JOHN J. KELLEY, S.M., PH.D., *Theology*
JOSEPH J. KEPES, PH.D., *Physics*
EDWIN R. KING, M.A., *History*
THEODORE KISIEL, PH.D., *Philosophy*
REV. MATTHEW F. KOHMESCHER, S.M., S.T.D., *Theology*
JOHN F. KUTOLOWSKI, M.A., *History*
DANIEL L. LEARY, PH.D., *Education*
CHARLES LEES, S.M., PH.D., *English*
CHARLES LEESE, PH.D., *Economics*
REV. EDWIN LEIMKUHLER, S.M., M.A., *Theology*
JOHN LUCIER, S.M., PH.D., *Chemistry*
REV. ADRIAN J. McCARTHY, S.M., PH.D., *Biology*
PAUL P. MACHOWICZ, S.M., PH.D., *Biology*
LEONARD A. MANN, S.M., PH.D., *Physics*
RAYMOND J. MARAS, PH.D., *History*
CARL I. MICHAELIS, PH.D., *Chemistry*
JOSEPH J. MOYLAN, PH.D., *Psychology*
JAGDISH L. NANDA, PH.D., *Mathematics*
REV. BERNARD A. NEUBAUER, S.M., M.A., *Theology*
GEORGE B. NOLAND, PH.D., *Biology*
DOROTHY NUNN, PH.D., *Biology*
BARBARA O'BRIEN, PH.D., *Chemistry*
DANIEL O'BRIEN, PH.D., *Chemistry*
EDMUND B. O'LEARY, PH.D., *Economics*
JOSEPH J. PANZER, S.M., PH.D., *Education*
JOSEPH A. PAPPALARDO, PH.D., *Chemistry*
ELMER H. PAYNE, M.S., *Engineering*
FREDERICK L. PHLEGAR, ED.D., *Education*
WERNER R. E. RAMBAUSKE, DR. RER.NAT., *Physics*
ANTOS S. RANCURELLO, PH.D., *Psychology*
ALDEN E. RAY, PH.D., *Engineering*
NEIL B. RESTON, M.A., *Education*
REV. EDMUND L. RHODES, S.M., S.T.L., *Philosophy*
REV. RAYMOND A. ROESCH, S.M., PH.D., *Psychology*
GEORGE J. RUPPEL, S.M., PH.D., *History*
SEYMOUR J. RYCKMAN, M.S., *Engineering*
JOHN T. SALSGIVER, M.ED., *Education*
CHARLES H. SCHEIDLER, PH.D., *Psychology*
THOMAS P. SCHICK, S.M., M.S., *Physics*
MERLE D. SCHMID, PH.D., *Engineering*
BERNHARD M. SCHMIDT, M.SC., *Engineering*
ANDREW F. SCHOTT, PH.D., *Education*
KENNETH C. SCHRAUT, PH.D., *Mathematics*
ROBERT J. SCHUELLEIN, S.M., PH.D., *Biology*
REV. ANDREW L. SEEBOLD, S.M., PH.D., *Education*
WILLIAM H. SIGMUND, M.ED., *Education*

PHILIP S. SHA, PH.D., *History*
GERTRUDE D. SHAY, M.S., *Biology*
LAWRENCE J. SOROHAN, PH.D., *Education*
GEORGE P. SPECK, M.S., *Mathematics*
JOSEPH W. STANDER, S.M., PH.D., *Mathematics*
REV. THOMAS A. STANLEY, S.M., S.T.D., *Theology*
WILFRED J. STEINER, PH.D., *History*
REV. BERNARD L. STUEVE, S.M., PH.D., *Education*
NORBERT A. STURM, S.M., PH.D., *English*
ROBERT A. THOMSON, S.M., PH.D., *Engineering*
EUGENE J. TORCHIA, ED.D., *Economics*
JESSE H. WILDER, M.S., *Engineering*
MAX S. WILLIS, PH.D., *Engineering*
MAURICE A. WOGAMAN, ED.D., *Education*
JAMES N. YAKURA, M.S., *Engineering*

GENERAL INFORMATION

RETROSPECT AND PROSPECT

The first organized program of graduate work at the University of Dayton was set up in the summer of 1939. It was modest in its beginnings, being limited to offerings in the fields of Education and English. This summer program was continued immediately in the regular school year of 1939-40, with an additional field in Philosophy. The faculty and students of the new unit formed a distinct division, having its own administration and its own objectives within the general framework of the educational policies of the University.

In the summer of 1942 the offerings of the Graduate Division were further extended to include the fields of Economics and Psychology, and in January of 1943 Political Science was added.

The content, policies, and scope of the graduate work at the University of Dayton grew out of the discussions and under the guidance of the Graduate Council of Ohio, particularly those held at Columbus in 1939, and out of the needs and demands of students in the Dayton area.

In this form the graduate division of the University carried on a successful program of work until 1949, when it was temporarily discontinued by the University on its own initiative, in order to devote all its facilities and personnel to the rapidly expanding undergraduate enrollment that flooded the campus after World War II.

During the period from 1945 to 1956, the University, therefore, concentrated its efforts on strengthening the undergraduate program in its facilities and faculty, having in view at all times the resumption of graduate work at the earliest possible date.

In 1956-57 a searching self-survey of the University was conducted, followed by an intensive program of self-improvement over the succeeding years, that gave ground for taking up again, with prudence and discretion, the kind of advanced work which the very name "University" connotes.

Accordingly, with clearance from the North Central Association of Colleges and Secondary Schools, and with the authorization of the State Department of Education of Ohio, the graduate work of the University of Dayton was reactivated in the summer of 1960, with three distinct programs in the field of Education, leading toward a Master of Science in Education degree.

Through a rigorous investigation by a Committee on Graduate Studies, specifically created for the purpose, the departments of Theology, History, Mathematics, and Chemistry were cleared for advanced work, and, in the summer of 1961, the Graduate School of Arts and Sciences was inaugurated to administer graduate programs leading to the Master of Arts and Master of Science degrees.

Finally, after careful study of local needs and the resources of the School of Engineering, the University further expanded its graduate offerings by the initiation of a program of study leading to the Master of Science in Engineering degree. This program was launched in the fall semester 1961-62.

STATEMENT OF PURPOSE

The ultimate purpose of graduate work at the University of Dayton is

identical with the general purpose of the University itself, namely, "to provide an academic atmosphere in which Christian principles of thought and acton are the essential integrating and dynamic forces impelling the students to pursue, to cherish, and to disseminate what is true, good and beautiful."

The immediate objectives of a graduate school distinguish it from every other type or level of educational institution. Through its faculty, it seeks to create and maintain an academic atmosphere that is essential to graduate work. Its influence, therefore, extends first to its own membership, by promoting all forms of scholarly activity.

It labors further to give its students a thorough grasp of a chosen field of knowledge, special skills in methods of research, and sharpened powers of independent thought. Under the guidance and inspiration of a scholarly staff, students are given the constant use of library, laboratories, and other educational facilities. Above all, a graduate student is expected to bring marked initiative to his work and to assume full responsibility for the progress of his studies. The courses of instruction can be no more than the point of departure and a basis for wide reading and personal investigation.

The number of credit hours demanded for a graduate degree is merely the material requirement; the form and substance of graduate work are conceived as the mastery of a subject-matter with understanding of its relations to kindred branches of knowledge.

In short, graduate work, for the student at the University of Dayton, has for its purpose an integrated program of advanced study based on adequate undergraduate preparation in a specific field of study. It presupposes academic and personal maturity and makes more than average demand upon the initiative, the industry, and the scholarship of the candidates for an advanced degree.

ACCREDITATION

The University of Dayton is officially accredited by the following agencies:

The State of Ohio, Department of Education.

The North Central Association of Colleges and Secondary Schools.

The National Council for Accreditation of Teacher Education (for preparation of elementary and secondary school teachers).

The American Medical Association (for the Pre-Medical program).

The American Chemical Society (for Chemistry).

The Engineers' Council for Professional Development (for Civil, Electrical, and Mechanical Engineering curricula; also for programs of Electrical, Industrial, and Mechanical Technology in the Technical Institute).

The University holds institutional membership in the following professional education associations: The Association of American Colleges; The American Association of Colleges for Teacher Education; The American Council on Education; The American Society for Engineering Education; The International Council on Education for Teaching; The National Catholic Education Association; The National League for Nursing; The Ohio Association of Counselor Educators; The Ohio College Association; The Council on Social Work Education; The Ohio Council for the Advancement of Educational Administration; Ohio Council on Advanced Placement.

ACADEMIC INFORMATION

ADMISSION

Men and women graduates of approved colleges or universities with a bachelor's degree are eligible for admission. Applicants must have had an adequate undergraduate preparation in their proposed field of study and must show promise for pursuing higher studies satisfactorily.

APPLICATION FOR ADMISSION

Inquiries concerning admissions and requests for application forms should be addressed to the Dean of the school in which the applicant wishes to become a candidate for a degree, that is, the Dean of the Graduate School of Arts and Sciences, the Dean of the School of Education, or the Dean of the School of Engineering.

The application blank should be filled out completely and returned promptly to the proper dean.

The application for admission to graduate work should be submitted to the proper dean by August 1 for the fall term, by December 1 for the second term, by April 1 for the third term, and by June 1 for the second half of the split third term (or the regular 6 week summer session). It is the responsibility of the student that his application, with all the necessary supporting documents, be complete and in order before these dates, if he is to be admitted as a graduate student.

Qualified students from foreign countries may be admitted to graduate courses for which they are prepared, and, if found capable, to pursue a program leading to a degree. In addition to the information required of all students, the foreign student must submit with his application for admission:

1. A statement from a qualified official that the applicant can read, write, speak, and understand English sufficiently to pursue a program of graduate work in the field of his choice (exception being made for those whose native language is English).
2. A statement certified by a responsible person or group that his finances are sufficient to maintain him while in residence.
3. A statement by a responsible medical authority certifying to the student's physical, mental, and emotional balance adequate for the work he intends to undertake.

CLASSIFICATION OF STUDENTS AFTER ADMISSION

Regular Students

Regular students are those who have met satisfactorily all general and specific requirements of the various schools in which the student is accepted and of the Department in which he is working.

Special Students

Special students are those who belong to any of the following categories:

1. Those on conditional status, that is to say, applicants who must fulfill some prerequisite imposed by the specific School and Department, before their admission to regular status.
2. Non-programmed students who fulfill all degree requirements and are

taking courses for credit, but are not seeking a degree.

3. Auditors, that is, properly qualified students who wish to follow graduate courses without working toward a degree and without credit. Auditors may be admitted to graduate courses with the permission of and under the conditions required by the Dean. Tuition for auditors is the same as for regular students.
4. Those properly qualified students working toward a degree in another institution who are authorized by the Dean of that institution to take specific courses at the University of Dayton, for transfer of credit. Such students must satisfy all the registration requirements in the given course that are mandatory for students working toward a degree at the University of Dayton.

DEGREES

The University of Dayton offers advanced studies leading to a degree of *Master of Arts, Master of Science, Master of Science in Education,* and *Master of Science in Engineering.*

SPECIFIC REQUIREMENTS FOR ALL DEGREES

Course Requirements

To date the Schools of Arts and Sciences, Education, and Engineering offer programs variously distributed in time, leading to the Master's degree. Specific requirements are listed in those sections of this Bulletin which describe these degrees. Each School also provides through a particular course-offering, a philosophical orientation to the over-all intent of the graduate programs in order to insure correlation with the general purposes of the University.

Residence Requirements

Residence requirements at the University of Dayton call for the equivalent of time normally demanded by the successful completion of twenty-four credit hours of graduate work. During the initial years of operation of any program, exceptions to this limitation may be made with the approval of the Dean concerned.

Time Limit

All requirements for a Master's degree must be satisfied within five calendar years from the time of admission to candidacy.

Graduate Work in Other Institutions

A maximum of six semester credit hours of graduate work may be allowed in transfer from other accredited institutions provided the work be of "B" grade quality or better. During the initial years of operation of any program, exceptions to this limitation may be made with the approval of the Dean concerned.

Registration of Undergraduate Students for Graduate Courses

An undergraduate student may register for graduate courses only under the following conditions:

1. Approval must be obtained from the Graduate Committee of the particular Graduate School offering the course.

2. The student must be within fifteen (15) semester hours of completing the credit hour requirements for graduation in his undergraduate program.
3. The student's total load must not exceed twenty-one (21) hours, with the graduate courses counting as a double load.
4. Credit obtained for the graduate courses may not be counted toward two degrees. At the time the student is admitted to his graduate program, he may apply for transfer of such graduate credit as had not been applied to the undergraduate degree.
5. The graduate tuition rates must be paid when registering in graduate courses.

Language Requirement

A reading knowledge of a foreign language may be required for a Master's degree. Requirements for the individual degrees should be consulted. Language courses for the convenience of graduate students can be had by special arrangement on a class or tutorial basis, through the Director of the Evening Classes. No graduate credit is allowed for the fulfillment of these language requirements.

Grades and Examinations

Marks are expressed on the student's permanent record by the following letter grades:

A — Excellent .....4 quality points
B — Good .....3 quality points
C — Passing .....2 quality points
F — Failing .....0 quality points
I — Incomplete .....0 quality points
W — Withdrawal .....0 quality points

Admission to Candidacy

It is the student's responsibility to apply for admission to candidacy. Application blanks may be obtained from the Dean's office. The most important consideration in the admission of a student to candidacy is the qualitative standard of the student's record in his graduate work. Applicants who are deemed unqualified at this point will be advised to discontinue their program.

Comprehensive Examinations

A comprehensive examination is required by all Schools for the Master's degree. The examination may be oral or written, or both. Applications for all comprehensive examinations must be approved by the Chairman of the student's major department at least two weeks prior to the examination. Students who fail in a comprehensive examination may on the recommendation of the Chairman of the Department, be admitted to a second examination, but not sooner than the next semester or summer session, and no later than one calendar year. If a second examination is unsatisfactory, no further trial can be admitted.

Thesis

In those departments requiring a thesis or an equivalent project, the work

may not be undertaken without the approval of the Departmental Chairman or of an advisor delegated by the Dean; both the form and the content of the thesis must have the approval of three members of the Department, including the faculty advisor and the Chairman.

Three final copies of an approved thesis in correct form must be submitted by the student as designated by the office of the Dean.

Theses may not be published, in whole or in part, without the approval of the Administration of the University.

Withdrawals from Courses

Any withdrawal or change of course after the last date of late registration is allowed only with written permission. Any change of course or withdrawal must be filed with each office that has a record of the student's admission form.

Use of Advanced Undergraduate Courses in the Graduate Program

1. Not more than six semester credit hours of the student's total graduate program may be selected from designated upper-division (300-400) courses.
2. When upper-division courses are permitted for credit on the graduate level, the work done in such courses shall be of "B" grade or better.

REGISTRATION

Registration is required each semester or session of all students who enter course work for credit; and of all students who wish to audit courses. Graduate students register on the regular registration days on the dates and at the times assigned to the evening school. The written approval of the proper Dean is required for admission to any course.

LIBRARY RESOURCES

The Albert Emanuel Library houses all *general holdings* plus the concentration of titles in the field of Electrical Engineering.

Graduate students have the privilege of open access to the stacks in the Albert Emanuel Library upon presentation of their registration card to the librarian.

Specialized libraries are also open to graduate students as follows:

1. Departmental Libraries
   a. Biology, Mathematics, Physics, Psychology . . . Sherman Hall Library, third floor.
   b. Chemistry, and Chemical, Mechanical, and Civil Engineering . . . Wohlleben Hall Library, third floor.
   c. Mariology . . . Marian Library on second floor of Albert Emanuel Library.
   d. Education . . . Curriculum Library on second floor of Chaminade Hall.
2. Other Libraries in the Area:
   There are several other libraries in the area available to graduate students. These include the public libraries, the Engineers' Club, Miami Valley Hospital, certain local industries, certain areas at

Wright-Patterson Air Force Base, and the libraries of the affiliated institutions.

SEPARATION FROM THE UNIVERSITY

Separation from the University may follow upon graduation, withdrawal by the student, or dismissal.

The admission of candidates, their continuance and status, the awarding of academic credits, and the granting of a degree, are all subject to the ordinary regulatory powers of the University. It reserves the right to cancel, at its discretion, any of these privileges for reasons considered sufficient by its own governing body.

The various Deans reserve the right to review at intervals the work of its graduate students, and, in consultation with the Chairman of the Department, to recommend that those who are not doing work of a high caliber be advised to discontinue courses leading to a degree.

The disciplinary authority of the University is vested in the President by right, and in the Deans and other officers on whom jurisdiction may be conferred for specific cases and in restricted areas.

For transcripts of records, application should be made to the Office of the Registrar of the University. Transcripts are issued only as requested by the student. In normal periods of the calendar year, excluding principally registration or examination periods, a time allowance of a week should be made for the preparation of a transcript. The first copy requested after graduation will be issued gratis. For each additional record, a fee of $1.00 will be charged.

FINANCIAL INFORMATION

GENERAL REGULATIONS

It is a general rule of the University that tuition and laboratory fees are payable before attendance at any instructional or laboratory period, unless exceptional arrangements have been made with the Business Manager of the University and cleared by him in writing through the office of the Treasurer.

All fees are subject to change at the discretion of the Trustees of the University.

Applications for refunds on any kind of fees will be given consideration only within the limits of time and amount set by the general rules of the University.

Where voluntary withdrawal, dismissal, illness, physical disability, or any extraordinary contingencies require a student to leave, he must notify the Dean of the School in which he is enrolled.

VETERANS

Veterans admitted to graduate courses must submit with their formal registration the Certificate of Eligibility for studies by the V.A. under Title 38, United States Code. Lacking the necessary document applicable to his case, the prospective student must register as a non-veteran and pay the required tuition and fees.

Application for benefits under Title 38, United States Code, is made at the Veterans Administration in Cincinnati. Advice and consultation for veterans may be had at the Veterans Service Office of the University of Dayton in St. Mary's Hall.

TUITION AND FEES

Tuition for Courses Taken for Undergraduate Credit

Per registered credit hour for lecture course	$21.00
Per clock hour for laboratory course	$14.00

Tuition for Courses Taken for Graduate Credit

Per registered credit hour for lecture course	$24.00—$30.00
Per clock hour for laboratory course	$18.00

Fees

Registration	$ 2.00
Penalty for late registration	$ 5.00
A second comprehensive examination	$25.00
A second language examination	$10.00
A deferred semester examination	$ 5.00
Graduation	$25.00
Transcripts: First transcript	No charge
Each subsequent transcript	$ 1.00

FELLOWSHIPS, SCHOLARSHIPS, ASSISTANTSHIPS

A limited number of Research Fellowships and of Research or Teaching Assistantships are available to students who are qualified. These carry a stipend and tuition refund provision which enables the recipients to complete the requirements for the degree in a two-year period.

Detailed information and forms for making application may be secured from the Dean of the School in which study is to be done.

GRADUATE SCHOOL OF ARTS AND SCIENCES

The objectives of Graduate work in the Arts and Sciences coincide with the general aims and philosophy of education that characterize the University of Dayton. Specific objectives and requirements of the several departments are presented in the following programs:

I. THE MASTER'S PROGRAM IN BIOLOGY

1. STATEMENT OF PURPOSE:

The general objective of graduate work in the Department of Biology is to give the student a basis for a thorough understanding and appreciation of his chosen discipline. Specifically, the graduate program is intended:

a. To enable the student to pursue studies toward more advanced degrees.
b. To qualify the student for industrial and governmental careers in the field of Applied Biology.
c. To equip teachers for scholarly competence in Biology.

2. SPECIFIC REQUIREMENTS OF THE DEPARTMENT:

a. Undergraduate prerequisites:

An applicant is admitted if the admissions committee of the Department is satisfied that the applicant is fully qualified to undertake the degree program.

The following undergraduate prerequisites are recommended:

(1) A total of twenty-four to thirty credit hours in the field of Biology, of which eighteen to twenty-four credit hours must correspond to the Department's 300-400 course designation.
(2) Two semesters each of General Chemistry and Organic Chemistry.
(3) Two semesters of Physics.
(4) Two semesters of Mathematics, usually Algebra and Trigonometry.

The graduate student may be required to fulfill undergraduate prerequisites before he is admitted to graduate courses for which, in the judgment of the Departmental Committee, the student is not qualified.

b. Seminars:

Graduate students are required to participate in seminars conducted by the Department of Biology. A maximum of two graduate credit hours will be permitted for these seminars.

c. Requirements for the Master's Degree in Biology:

(1) Thirty credit hours of acceptable course work and research. The graduate student is permitted three to six credit hours for research.
(2) The graduate student must have included in his academic record, either at the undergraduate or graduate level, courses in Genetics, Physiology, Microbiology and Histology.
(3) Pro-Seminar: Will be offered at regular intervals to satisfy University requirements; may be replaced by Phl 505: Problems in the Philosophy of Science.
(4) A general written examination following the completion of a major portion of the course requirements.
(5) The presentation and acceptance of a thesis based on the student's

laboratory research problem. At the discretion of the departmental Graduate Committee, the graduate student may be permitted to present an acceptable thesis based on an exhaustive literature research or a project approved by the Department.

3. COURSE OFFERINGS:

The program is designed so that part-time students will be able to obtain the Master's degree in five terms of late afternoon, evening, and summer sessions.

The course offerings for 1963-64 are as follows:

First Term — August 1963:

BIO 325 Parasitology
BIO 407 Embryology
BIO 410 Radiation Biology
BIO 515 Bacterial Physiology
BIO 520 Principles of Biology

Second Term — January 1964:

BIO 320 Evolution
BIO 330 Plant Physiology
BIO 501 Seminar
BIO 503 Advanced Genetics
BIO 520 Principles of Biology

Summer Session 1964:

BIO 501 Seminar
BIO 508 Field Biology
BIO 513 Mycology
BIO 520 Principles of Biology

II. THE MASTER'S PROGRAM IN CHEMISTRY

1. STATEMENT OF PURPOSE:

The purpose of the Master's program in Chemistry is to present to the student a rigorous approach to modern theories in Chemistry, and to increase his desire and potential toward fundamental research through a program of literature search and laboratory experimentation.

2. SPECIFIC REQUIREMENTS OF THE DEPARTMENT:

a. Undergraduate prerequisites:

The undergraduate prerequisites shall be the minimum requirements specified by the American Chemical Society. Those students who have graduated from A.C.S. approved schools will have fulfilled these requirements. Others may have to take certain courses concurrently from the undergraduate program to meet A.C.S. requirements.

b. Undergraduate courses open to graduate students:

Credit for certain undergraduate non-Chemistry electives may be allowed at the discretion of the Chairman of the Department.

c. Requirements in terms of credit hours for the Master's Degree in Chemistry:

Twenty-four credit hours of course work and six credit hours of research

are required. A thesis based on the research, which may be an exhaustive literature search, is required. Every thesis must be approved by a Thesis Committee, appointed by the Chairman of the Department.

The following courses are required:

CHM 503 Advanced Inorganic Chemistry
CHM 504 Advanced Inorganic Chemistry
CHM 505 Advanced Organic Chemistry
CHM 506 Advanced Organic Chemistry
CHM 507 Advanced Physical Chemistry
CHM 508 Advanced Physical Chemistry
CHM 510 Pro-Seminar or PHL 505
CHM 520-521 Research

Electives:

Three hours of electives which may be taken from the following listing. Other electives may be chosen with the approval of the Chairman of the Chemistry Department.

CHM 511 Biochemistry
CHM 514 Advanced Analytical Chemistry
MTH 421 Advanced Calculus I
PHY 420 Introduction to the Solid State
PHY 440 X-Rays

3. COURSE OFFERINGS:

The program is designed so that part-time students will be able to obtain the Master's degree in five terms of late afternoon and evening sessions. The course offerings for 1963-64 are as follows:

First Term — August 1963:

CHM 503 Advanced Inorganic Chemistry
CHM 505 Advanced Organic Chemistry
CHM 520 Research

Second Term — January 1964:

CHM 504 Advanced Inorganic Chemistry
CHM 506 Advanced Organic Chemistry
CHM 521 Research

III. THE MASTER'S PROGRAM IN HISTORY

1. STATEMENT OF PURPOSE:

The Department of History through its graduate program seeks to develop in the student that combination of mature judgment and scholarly competence associated with the ability to make, compare, test, and evaluate historical conclusions and interpretations.

As a secondary purpose, the program is designed to prepare the student for a successful career in teaching, government services, or specific fields of private endeavor.

2. SPECIFIC REQUIREMENTS OF THE DEPARTMENT:

a. Undergraduate prerequisites:

Applicants for the graduate program in History must have completed a

total of twenty-four semester credit hours of History, and must have achieved a grade-point average of at least 3.00 in all History courses.

b. Number and kind of courses allowed for advanced undergraduate and graduate students:

A maximum of six graduate credit hours may be taken from the upper level course offerings in History or in an allied field (see "e" below). These are the 300 and 400 courses listed in the University catalog. *Courses for which undergradulate credit has been allowed may not be repeated for graduate credit.*

c. Courses required of all students in the Master's Program in History:

HST 500 Historiography
HST 550 The Philosophy of History or PHL 505
HST 545 Seminar in Non-American History or
HST 595 Seminar in American History

d. Credit hour requirement for the Master's degree in History:

A minimum of thirty semester credit hours in History is required for the Master's degree in History. Nine semester credit hours must be taken from the list of required courses; fifteen semester credit hours may be taken from the list of subject matter courses; six semester credit hours will be granted for the thesis.

e. Credit hours in an allied field:

Six semester credit hours may be taken in an allied field upon approval of the Chairman of the Department.

f. Thesis:

A thesis is required of all candidates for the Master's degree in History. A maximum of six semester credit hours will be granted for the successful completion of the thesis (HST 599).

g. Examination:

An oral comprehensive examination must be passed by the candidate in his final term of study at least two weeks prior to graduation. Detailed instructions concerning this examination may be obtained from the Department Chairman. See also instructions on Page 14 of this *Bulletin*.

3. COURSES OF INSTRUCTION:

HST 500 Historiography
HST 501 Greek and Roman Civilization
HST 505 Great African States
HST 506 Medieval Civilization
HST 521 Tudor-Stuart England
HST 522 Victorian England
HST 528 Soviet Union since 1917
HST 531 The Civilization of the Far East
HST 540 Interpretations in World History
HST 545 Seminar in Non-American History
HST 550 The Philosophy of History
HST 552 The American Revolution
HST 555 The Immigrant in America
HST 570 The Old South

HST 580 History of the Labor Movement in the U.S.
HST 585 Science and Technology in American History
HST 590 Interpretations in American History
HST 595 Seminar in American History
HST 599 Thesis

4. COURSE OFFERINGS:

The program is designed so that students will be able to obtain the Master's degree in five terms of summer, late afternoon and evening sessions.

The course offerings for 1963-64 are as follows:

Summer Session — 1963:

HST 521 Tudor-Stuart England
HST 550 Philosophy of History
HST 599 Thesis

First Term — August 1963:

HST 500 Historiography
HST 599 Thesis

Second Term — January 1964:

HST 522 Victorian England
HST 599 Thesis

Summer Session — 1964:

HST 545 Seminar in Non-American History
HST 590 Interpretations in American History
HST 599 Thesis

NOTE: Additional courses on the 300 and 400 level will be offered in the Summer session and in the Evening School each semester which may be taken for Graduate credit subject to the restrictions previously mentioned.

IV. THE MASTER'S PROGRAM IN MATHEMATICS

1. STATEMENT OF PURPOSE:

The Department proposes to offer graduate studies in Mathematics in order to give an opportunity for properly prepared persons to acquire skills in those branches of Mathematics normally studied after the Baccalaureate degree. The curriculum is intended to serve as a firm basis for doctoral studies and research.

2. SPECIFIC REQUIREMENTS OF THE DEPARTMENT:

a. Undergraduate prerequisites:

MTH 301	3 hours
MTH 361	3 hours
MTH 421-422	6 hours

NOTE: (1) Other courses in Advanced Analysis may replace MTH 422 in this requirement.

(2) All 400 courses in the Department may be allowed for graduate students in Mathematics, except MTH 421.

b. Graduate requirements:

(1) Obligatory courses as follows:

MTH 521-522	Real Variables	6 hours
MTH 525	Complex Variables	3 hours
MTH 561 or	Abstract Algebra	3 hours
565	Linear Algebra	3 hours
MTH 471 or	Topology	3 hours
571	Linear Topological Spaces	3 hours
MTH 599	Philosophical Foundations of Mathematics	3 hours

(2) Requirements for Degree:
Thirty hours, as follows:

18 hours of required courses listed above as obligatory.

6 hours maximum of advanced undergraduate courses chosen from 400 courses.

6 hours maximum of approved courses outside of Department.

(3) A thesis with a maximum of six credit hours shall be permitted only in exceptional cases.

(4) No foreign language as such shall be required, but the students may expect to be assigned reading from Journals and Reference Works in French or German.

3. COURSES OF INSTRUCTION:

MTH 411-412	Probability and Statistics
MTH 417	Numerical Analysis
MTH 421-422	Advanced Calculus (Mth 421 not offered for graduate credit to students in Mathematics.)
MTH 432	Fourier Series
MTH 461	Complex Variables
MTH 465	Modern Operational Methods
MTH 471	Topology
MTH 521-522	Real Variables
MTH 525-526	Complex Variables
MTH 531-532	Advanced Differential Equations
MTH 535-536	Partial Differential Equations
MTH 541-542	Operational Methods
MTH 545	Special Functions
MTH 551-552	Methods of Mathematical Physics
MTH 555-556	Advanced Numerical Analysis
MTH 561	Abstract Algebra
MTH 565-566	Linear Algebra and Matrices
MTH 571-572	Linear Topological Spaces
MTH 575	Differential Geometry
MTH 599	Philosophical Foundations of Mathematics

4. COURSE OFFERINGS:

The program is designed so that part-time students will be able to obtain the Master's degree in five semesters of late afternoon and evening sessions.

The course offerings for 1963-64 are as follows:

First Term — August 1963:

MTH 432	Fourier Series and Boundary Value Problems
MTH 461	Introduction to the Theory of Functions of a Complex Variable
MTH 521	Real Variables I
MTH 531	Advanced Differential Equations I
MTH 565	Linear Algebra and Matrices I

Second Term — January 1964:

MTH 471	Topology
MTH 522	Real Variables II
MTH 532	Advanced Differential Equations II
MTH 566	Linear Algebra and Matrices II

V. THE MASTER'S PROGRAM IN PHILOSOPHY

1. STATEMENT OF PURPOSE:

The purpose of the graduate program in Philosophy is to provide an atmosphere for independent study and research, in which the student can gain a more comprehensive knowledge and deepen his understanding of Thomistic philosophy and of other major philosophical positions, develop his powers of critical analysis and his ability to apply philosophical principles to the solution of present-day problems.

Students working toward the Master of Arts degree in Philosophy will be subject to the general requirements of the Graduate School of Arts and Sciences program and to the specific requirements given below.

2. SPECIFIC REQUIREMENTS OF THE DEPARTMENT:

a. Undergraduate Prerequisites:

For a Master's degree in Philosophy, the student must have had the following undergraduate courses: Logic, Cosmology, Philosophical Psychology, Epistemology, General Metaphysics, Natural Theology, Ethics, History of Greek, and Medieval Philosophy.

b. Advanced Undergraduate Courses Open to Graduate Students:

Only two courses are permitted. Offerings will be restricted to a choice from the following:

PHL 408	History of Modern Philosophy
PHL 410	History of Political Philosophy
PHL 430	Philosophy of Plato
PHL 432	Philosophy of Aristotle
PHL 434	St. Thomas Aquinas

c. Obligatory Core Courses:

Six credit hours of core courses will be required of all regular students for the M.A. in Philosophy. The courses which constitute the core are listed under "Courses of Instruction" as PHL 515 and PHL 525.

d. Requirements in Terms of Credit Hours for an M.A. in Philosophy:

The student must take a minimum of thirty hours in graduate work, six of which are given for a thesis. At the discretion of the Chairman, six

of these hours may be taken in an allied field, as listed in Courses of Instruction, (3), (c), in this Outline.

e. Thesis Requirement:

A thesis will be required of all students in this program. An outline of his thesis should be submitted by the student to the Chairman three months prior to the expected graduation.

f. Language Requirement:

All students will be required to pass an examination on their reading knowledge of a foreign language. A reading knowledge of philosophical Latin, of French or of German will satisfy this requirement.

3. COURSES OF INSTRUCTION:

A distinctive feature of the Graduate Program in Philosophy is the special emphasis on Modern Philosophy.

a. Core Courses:

PHL 515 Methods of Research in Philosophy Seminar
PHL 525 Thomistic Texts and Commentaries
PHL 540 Aristotle's De Anima and St. Thomas' Commentary

b. Areas of Concentration:

PHL 545 Modern French Philosophy
PHL 555 Modern German Philosophy
PHL 560 Modern British Philosophy
PHL 565 The History and Literature of American Philosophy
PHL 570 Existentialist Philosophy

c. Allied Fields:

THL 500 Philosophy of Religion
EDU 502 Comparative Philosophies of Education
PHL 504 Philosophy of Art
PHL 505 Inter-Disciplinary Seminar
HST 550 Philosophy of History

4. PROGRAM FOR THE M.A. IN PHILOSOPHY:

The program is so designed that part-time students will be able to obtain the Master's degree in five terms of late afternoon, evening, and summer sessions.

5. COURSE OFFERINGS:

First Term—August 1963:

PHL 525 Thomistic Texts and Commentaries
PHL 560 Modern British Philosophy

Second Term — January 1964:

PHL 504 Philosophy of Art
PHL 515 Methods of Research in Philosophy Seminar

Summer 1964:

PHL 555 Modern German Philosophy
PHL 565 The History and Literature of American Philosophy

VI. THE MASTER'S PROGRAM IN THEOLOGY

1. STATEMENT OF PURPOSE:

The graduate program of Theology, leading to the degree of Master of Arts in that subject, is designed to satisfy the desire of religious and laity for a scientific training in sacred truth. It is of special value to teachers of Christian doctrine, for it provides them with a thorough grasp of the deep realities of Catholic theology, which is essential for effective teaching.

With the truth of the Incarnation as its core, the program follows a systematic curriculum of Catholic theological study. Courses in related fields are likewise offered. Because of the Marianist tradition at the University of Dayton, and the unique facilities afforded by the Marian Library, special programs will be offered in Mariology and the social apostolate. Thus the student will be given the opportunity for a deeper understanding of Catholic theology and an orientation toward his role in the Marian apostolate of the Church.

2. SPECIFIC REQUIREMENTS OF THE DEPARTMENT:

a. Undergraduate prerequisites:

Ordinarily, thirty hours of undergraduate theology and philosophy are required.

b. Use of advanced undergraduate courses in the graduate program:

Not more than six graduate semester credit hours of the student's total graduate program may be selected from designated upper-division courses. All four hundred courses except 406, 407, and 408 are "designated upper-division courses."

c. Obligatory core courses:

Among the graduate courses, 500 and 501 are courses in "allied fields" and must be taken by all candidates for the Master's Degree in Theology.

d. Types of programs and specific requirements of each:

The department offers two programs leading to a Master of Arts in Theology:

(1) *An Academic Program:* Twenty-four hours of content courses plus six hours for a thesis. The twenty-four hours must include six hours of core courses, twelve hours from a chosen field of concentration, and six hours from the other area of concentration. All who elect this program must have a reading knowledge of a foreign language (Latin, French, German, Italian, or Spanish) in order to pursue profitably the work of a thesis.

(2) *A Professional Program:* Thirty hours of content courses with a monograph on a problem defined in a seminar, preferably toward the end of the student's graduate studies. The thirty hours ordinarily include six hours of core courses, fifteen hours from a chosen major field of concentration, and nine hours from the other area of concentration.

3. PROGRAM FOR THE M.A. IN THEOLOGY:

The programs leading to a Master's degree in Theology will be offered only in the Summer Sessions. They can be completed in five Summer Sessions, and must be completed within seven calendar years.

4. COURSES OF INSTRUCTION:

a. Core courses: (six hours) Common to all programs.

THL 500 Philosophy of Religion *(Prerequisite:* PHL 207)
THL 501 History of Religion

b. Areas of concentration: (Nine to fifteen hours)

(1) The Advent of the Incarnation: Mariology

THL 505 Theology of Incarnation
THL 520 Role of the Mother of God in the Incarnation *(Prerequisite:* THL 342)
THL 521 Privileges of the Mother of God *(Prerequisite:* THL 444)
THL 522 History of Mariology
THL 590 Seminar with Monograph
THL 599 Thesis

(2) The Incarnation in History: The Church and the Apostolate

THL 540 The Church of Christ
THL 541 Church and State
THL 542 The Catholic Church in America
THL 543 Missiology: The Missionary Movement in the Church
THL 544 Theological Perspectives of the Apostolate
THL 545 Canon Law for the Laity
THL 590 Seminar with Monograph
THL 599 Thesis

5. COURSE OFFERINGS:

Summer 1963:

THL 500 Philosophy of Religion
THL 501 History of Religion
THL 522 History of Mariology

Summer 1964:

THL 520 Role of the Mother of God in the Incarnation
THL 540 The Church of Christ
THL 541 Church and State

SCHOOL OF EDUCATION

AIMS AND OBJECTIVES

The general objective of the School of Education coincides with the purpose of the University of Dayton: "To provide an academic atmosphere in which Christian principles of thought and action are the essential integrating and dynamic forces impelling the student to pursue, to cherish, and to disseminate what is true, good, and beautiful."

The particular objective of the School of Education is to develop those special capacities of the student which enable him to become an effective practitioner in the field of professional education.

The programs leading to the MASTER OF SCIENCE IN EDUCATION degree are designed primarily to meet the needs of school personnel who are actually engaged in school work in order to:

1. Develop *Master Teachers* on the elementary and secondary school levels.
2. Enable those teachers with at least one year's successful teaching experience to work toward certification as a school counselor.
3. Enable those teachers with at least three years' successful teaching experience to qualify for certification as principal, or as supervisor, or as executive head.

1. DEVELOPMENT OF MASTER TEACHERS

In undertaking the task of developing master teachers, the School endeavors to provide a continuation on the graduate level of a recognized baccalaureate teacher education program. It addresses itself to the needs of the in-service teacher and other professional school personnel who carry initial certification as teachers. Hence, the program represents an additional year beyond the professional baccalaureate degree involving work at a more advanced level than that which characterizes undergraduate study. (This Master's program is not to be confused with the fifth year undergraduate program for graduates holding a liberal arts or other non-professional baccalaureate degree which the School of Education has carried for the past several years. The latter fifth-year undergraduate program simply prepares the candidate for initial teacher certification. For details of this undergraduate program, see University of Dayton Catalog, Program X, "For Non-Professional Degree Holders," p. 138.)

Through sufficient curriculum flexibility, the undergraduate and graduate education of teachers at the University of Dayton represent parts of a carefully planned inter-locking single program. The graduate level of this program simply focuses attention on those needs of an in-service teacher that go beyond his pre-service curriculum.

a. Master High School Teachers: To develop master teachers on the secondary school level, a program is provided to enable the teacher to advance himself primarily in the *SUBJECT-MATTER* of his teaching field.

b. Master Elementary School Teachers: To develop master teachers on the elementary school level, a program is planned to fit the special needs of each teacher involving provision on the graduate level for greater depth in general education, or greater mastery of an academic subject field, or

greater proficiency in professional practice, or a combination of two or all three of the above. Considerable attention is directed to those objectives which are established through a clear conception of what the competencies and qualities of a skilled teacher should be.

2. PREPARATION OF SCHOOL COUNSELORS:

This program is designed to prepare school personnel for specialized services in the area of school guidance and counseling. This preparation calls for the development of competencies that enable the counselor to perform such duties as:

a. Counseling pupils on their curricular programs, extra-curricular activities, in their personal-social adjustment, in occupational adjustment, in placement problems, and in other related matters.

b. Working with teachers in studying, diagnosing, and understanding students; planning and conducting group guidance activities; utilizing community resources; and participating in in-service teacher-education activities.

c. Working with the administrative staff and other school personnel in planning, developing, and conducting the total guidance program, curriculum study, and research.

d. Working with lay groups, parents, and individuals in coordinating school and community resources and activities which contribute to improve pupil personnel services.

3. PREPARATION OF SCHOOL ADMINISTRATORS:

This program endeavors to develop in the candidate such attributes as the following:

a. Knowledge of the purposes of the work to be administered and a sincere loyalty to those purposes.

b. Appreciation and use of the strategic institutional structure to carry out the purposes.

c. Knowledge of the large principles of administration (the science of administration) to apply them particularly in elementary and secondary school administration.

d. Knowledge and practice of the principles of effective supervision.

e. Understanding of the processes of evaluation of the whole school program in the light of the school's philosophy and objectives, plus the ability to apply these processes to curriculum improvement.

f. Ability in social and professional leadership in both school and community which will cause the candidate to be recognized as an organizer and leader.

g. Ability to locate and solve problems within a school or school system on the basis of sound research, understandings, and practices.

h. Functional knowledge of the ethics of the teaching profession.

i. Functional knowledge of the principles and procedures of guidance.

THE MASTER'S PROGRAM IN EDUCATION

1. TITLE AND MEANING OF THE DEGREE:

The title of the Master's degree to which all three of the indicated programs lead is the MASTER OF SCIENCE IN EDUCATION. Insofar as this degree represents the attainment of a definite and inclusive professional objective, it may be viewed as a terminal degree; i.e., it is not planned as a step toward the doctor's degree even though the latter may not necessarily be precluded.

The awarding of this degree means that the candidate has completed a program of graduate work designed to give him the following characteristics:

a. Broader knowledge of an advanced nature of the tested psychological and philosophical theories of education.

b. Essential understandings and skills necessary for intelligent consumption of educational research.

c. More extensive knowledge and skill involved in teaching, or in school counseling, or in school administration.

d. Ability to contribute toward the improvement of school conditions and/or professional practice through on-the-job research.

2. AUTHORIZATION:

The University of Dayton's offerings in graduate work leading to the MASTER OF SCIENCE IN EDUCATION degree have the approval of the North Central Association of Colleges and Secondary Schools and of the State of Ohio, Department of Education.

The programs in School Counseling and in School Administration lead to Provisional Certification by the State of Ohio.

The Master Teacher program may lead to Eight Year Professional or to Permanent Certification depending on the years of successful teaching performed under the previous certificate held.

3. ADMISSION REQUIREMENTS:

The School of Education accepts those students into its graduate program who can present undergraduate records which show them capable of meeting the standards of graduate work and of becoming leaders in their respective fields of professional education.

Applicants may be admitted either as *special students* or as *regular students.*

Special students are those who do not intend to become candidates for the Master's degree or are deficient in entrance requirements. *Special students* may later be admitted as *regular students* when the requirements are met.

Regular students are those who are admitted with the expressed intention of following a program leading to the Master's degree.

In order to qualify for registration in any graduate course, both *special students* and *regular students* must hold a teacher's certificate on a bachelor's degree from an accredited institution (at least State Accreditation) and must have attained an undergraduate quality-point average of at least 2.500 on hours attempted.

An applicant who is not a graduate of the University of Dayton must submit complete official transcripts of all of his previous college studies.

These transcripts should be sent directly to the "Chairman of the Graduate Committee, School of Education" from the degree-granting institution at least twenty days before the opening of the semester or summer session in which the student expects to enroll.

Inquiries concerning admission and requests for application forms should be addressed to the "Chairman of the Graduate Committee, School of Education."

Admission to graduate study as a *special student* or as a *regular student* does not imply *admission to candidacy for a degree.*

4. ENTRANCE EXAMINATION:

Either the *Graduate Record Examination* or the *Teacher Education Examination Program* is required of all graduate students, and the results must be on file with the Graduate Committee, School of Education, prior to candidacy for the degree.

The *Graduate Record Examination* is given four times annually at a number of universities including the University of Dayton. One may register for the examination by (1) requesting application forms from the Education Office at U.D., Room C-213, and (2) forwarding the completed forms with the necessary fees to the Educational Testing Service, Princeton, New Jersey, 30 days before the examination is to be held. Both the Aptitude Test and one Advanced Test should be taken.

The *Teacher Education Examination Program* is administered directly by the School of Education four times a year. The dates when the *TEEP Examinations* are scheduled to be given are announced in the calendar of this *Bulletin.* The fee for the examinations as assessed by the Educational Testing Service, Princeton, New Jersey, is $5.00 per person. (This same *TEEP* is being used as the comprehensive examinations for under-graduate Seniors in partial fulfillment of the requirements for the BACHELOR OF SCIENCE IN EDUCATION Degree.)

The Teacher Education Examination Program consists of the General Professional Examinations and a series of Teaching Field Tests.

The General Professional Examinations have seven discrete tests which are designed to measure the student's knowledge and understanding of the basic principles in professional education, English usage, and general culture. Other significant factors which contribute to teacher-effectiveness, such as personality and interest in children, are not measured by the examinations. The student takes this group of tests in one session of 185 minutes.

The Teaching Field Tests provide the student with an opportunity to demonstrate certain competencies essential for teaching in a specific field. The time limit for each test is 80 minutes, and the student should take one (preferably in his principal teaching field). The tests are:

Early Childhood Education
Elementary School Education
English Language and Literature
Social Studies (History-Government included)
Biological Science
Physical Science
Mathematics
French

Spanish
Physical Education
Business Education
Music Education

Early Childhood Education is designed primarily for students preparing to teach kindergarten through third grade. Elementary School Education covers the broad range of elementary education from grade one through eight. The remaining Teaching Field Tests are appropriate for students preparing to teach at the secondary-school level.

It is recommended that students take the General Professional Examinations and at least one Teaching Field Test. This recommendation is based on the belief that all pre-service or in-service teachers should be able to demonstrate reasonable competence with respect to professional knowledge, English usage, and general culture as well as specific competencies in a teaching field.

All of the questions are of the objective multiple-choice type. Examinees mark their answers on a separate answer sheet, using a special electrographic pencil provided by ETS.

Scores on all of the tests will be reported as scaled scores established so as to have a mean of 20 and a standard deviation of 5 for a sample of seniors preparing to teach. Scores will range from approximately 5 to 35.

5. ADMISSION TO CANDIDACY FOR DEGREE:

A student becomes a candidate for the MASTER OF SCIENCE IN EDUCATION degree upon approval of his credentials. At this time the candidate is assigned to an official adviser who will guide the student in his degree program and direct his Field Project.

To receive the approval, the student must meet the following conditions:

a. Application should be filed with the Graduate Committee after the completion of at least the prescribed *nine semester hours* in the core subjects and after the results of the *Graduate Record Examination* or of the *Teacher Education Examination Program* are on record in the student's confidential folder (in Education office).

The most important consideration in the admission of a student to candidacy is the qualitative standard of the student's record in his graduate work. Applicants who are deemed unqualified at this point will be advised to discontinue their program.

b. The applicant must submit the following kinds of evidence, depending on his field of concentration:

(1) Applicants who are pursuing the *Master Teaching* program must present evidence of at least one year of successful teaching.

(2) Applicants with a concentration in *Administration* must present evidence of at least three years of successful teaching, a letter of recommendation to the program from an administrator in position to judge the potential ability of the applicant, and must submit to careful screening to guarantee wholesome leadership qualities.

(3) Applicants with a concentration in *School Counseling* must present evidence of at least one year of successful teaching and must submit to careful screening to guarantee wholesome personal, emotional, and social

adjustment. (To facilitate this screening, recommendations of school supervisors and principals under whom the candidate has taught shall be examined together with recommendations of the U. D. Guidance Center through interpretation of appropriate tests.)

c. The applicant must submit an acceptable preliminary plan regarding his Field Project as developed in EDU 503.

6. REQUIREMENTS FOR THE DEGREE:

a. Credit Hours—The minimum requirement for the MASTER OF SCIENCE IN EDUCATION degree is a total of 30 semester credit hours. This includes the research for a Field Project done in conjunction with EDU 590 FIELD PROJECT.

b. Required Average—Students on regular status must achieve an average of at least 3.00 ("B" average) in all work undertaken in order to qualify for graduation.

c. Field Project—The student must submit three typed copies of his *Field Project Report* together with a publishable article on his field project.

d. Oral Examination—The student must pass a final oral examination held by his examining board. This examination covers the whole field of the student's graduate studies including his Field Project. This examination may be taken after the completion of his Field Project but not later than two weeks before graduation. A student who fails his oral examination may be given permission to take a second examination at the discretion of the examining board at least one semester or summer term, but no later than one academic year, after the first examination. No third examination is given.

7. ADVISEMENT:

The Dean of the School of Education acts as general advisor to all graduate students before their admission to candidacy for the Master's degree. In this capacity, he will counsel students with a view toward orienting them in the purposes and requirements of graduate work and will assist them until they are admitted to candidacy and a special adviser is appointed.

PROGRAM OF STUDIES

1. CORE COURSES:

To insure proper orientation and a measure of integration in the programs for the MASTER OF SCIENCE IN EDUCATION degree, all candidates must include three core courses which are planned to supply a basic synthesis for the proper guidance of educational theory and practice. These courses are:

EDU 502 Comparative Philosophies of Education.....3 credit hours
EDU 503 Research Methodology and Statistics.....3 credit hours
EDU 504 Advanced Child and Adolescent Psychology..3 credit hours
(Required in the School Counseling Program)
or
EDU 501 Advanced Educational Psychology.....3 credit hours

2. AREA OF CONCENTRATION:

To insure mastery of a particular area of education, all candidates must include in their programs one of the following areas of concentration:

a. Master High School Teachers.....(12 credit hours)

For high school teachers, concentration must be in an academic field for furtherance of subject-matter mastery in a recognized teaching field.

b. Master Elementary Teachers.....(6 credit hours)

For elementary teachers, concentration must be in specified professional education courses, as follows:

EDU 511 Elementary School Curriculum.....2 credit hours
EDU 519 Principles of Guidance.....2 credit hours
EDU 520 Psychology of Individual Differences.....2 credit hours
(Teachers who wish to move from elementary teaching to high school teaching should follow the Master High School Teacher Program.)

c. School Counseling Program.....(16 credit hours)

Concentration must include:

Prerequisite: EDU 448 Psychodynamics of Behavior....3 credit hours
(or a combination of undergraduate courses in Mental Hygiene and Abnormal Psychology).
EDU 519 Principles of Guidance.....2 credit hours
EDU 523 Occupational Information and Community Resources .....2 credit hours
EDU 530 Psychology of Individual Differences.....2 credit hours
EDU 533 Psychometrics .....3 credit hours
EDU 539 Administration of a School Guidance Program .....2 credit hours
EDU 543 Principles and Techniques of Counseling.....3 credit hours
EDU 544 Practicum in Counseling Techniques.....2 credit hours

d. School Administration Program:

(1) *Elementary School Principal*.....(12 credit hours)
EDU 506 School Administration.....3 credit hours
EDU 509 School Supervision .....3 credit hours

EDU 511 Elementary School Curriculum ..... 2 credit hours
EDU 513 Elementary School Evaluation ..... 2 credit hours
EDU 519 Principles of Guidance ..... 2 credit hours

(2) *Secondary School Principal* ..... (12 credit hours)
EDU 506 School Administration ..... 3 credit hours
EDU 509 School Supervision ..... 3 credit hours
EDU 512 Secondary School Curriculum ..... 2 credit hours
EDU 514 Secondary School Evaluation ..... 2 credit hours
EDU 519 Principles of Guidance ..... 2 credit hours

(3) *Executive Head* ..... (17 credit hours)
EDU 506 School Administration ..... 3 credit hours
EDU 509 School Supervision ..... 3 credit hours
EDU 511 Elementary School Curriculum ..... 2 credit hours
EDU 512 Secondary School Curriculum ..... 2 credit hours
EDU 515 School Law ..... 2 credit hours
EDU 517 School Finance ..... 2 credit hours
EDU 518 School and the Social Order ..... 3 credit hours

(4) *Supervisory* ..... (14 credit hours)
EDU 509 School Supervision ..... 3 credit hours
EDU 511 Elementary School Curriculum ..... 2 credit hours
EDU 512 Secondary School Curriculum ..... 2 credit hours
EDU 513-14 Elementary or Secondary School Evaluation ..... 2 credit hours
EDU 518 School and the Social Order ..... 3 credit hours
EDU 530 Psychology of Individual Differences ..... 2 credit hours

3. ELECTIVES:

To round out the candidate's needs in line with the major purpose to be served through the Master's degree, the candidate may elect under advisement sufficient credit hours of pertinent course work depending upon the number of indicated hours required in the area of concentration.

a. Master High School Teachers ..... (6 credit hours)

Elective courses should preferably be selected from the student's teaching field or allied fields; they may also be selected with the approval of the adviser from courses in general education or professional education.

b. Master Elementary Teachers ..... (12 credit hours)

The student is directed into such a selection of courses as would best serve to complete his pre-service curriculum and to give him the professional skills needed. Consequently these twelve elective hours may be selected from one of the following three areas or a combination thereof: (1) a departmental subject-matter field to follow through on an area of academic concentration; (2) courses from one or more graduate academic departments to fulfill a broadening of general education; (3) or professional education courses.

c. School Counseling Program ..... (2 credit hours)

This course may be selected from the following:
EDU 534 Interpretation of Individual Tests ..... 2 credit hours

EDU 539 Administration of a School Guidance Program ..... 2 credit hours
EDU 547 Psychology of Exceptional Children..... 2 credit hours
EDU 550 Reading Problems and the Guidance Program ..... 2 credit hours

d. School Administration Program..... (4-6 credit hours)

Future administrators are advised to elect four to six additional semester hours (Executive Heads elect two additional sem. hrs.) from the following:

EDU 515 School Law ..... 2 credit hours
EDU 517 School Finance ..... 2 credit hours
EDU 518 School and the Social Order ..... 3 credit hours
EDU 519 Principles of Guidance ..... 2 credit hours
EDU 521 School Public Relations ..... 2 credit hours
EDU 530 Psychology of Individual Differences..... 2 credit hours
EDU 539 Administration of a School Guidance Program ..... 2 credit hours
EDU 541 Case Studies in School Guidance and Counseling ..... 2 credit hours
EDU 543 Principles and Techniques of Counseling ..... 3 credit hours
EDU 547 Psychology of Exceptional Children..... 2 credit hours
ECO 501 Advanced Principles of Economics..... 3 credit hours

4. FIELD PROJECT:

To prepare the candidate as a qualified contributor toward locating and solving problems within a school or school system or in his own teaching or counseling performance, the candidate must evidence proficiency in research through conducting a successful field project.

The actual manuscript (not necessarily in final and bound form) together with "the publishable article" as derived from the project need to be completed before the close of the semester or summer session during which the student has registered for "EDU 590 FIELD PROJECT." If the requirements are not met by the close of the given semester or summer session, the student receives the grade of "W" for "withdrew."

The student must then re-register for EDU 590 during another semester or summer session, in which case he will again be required to pay the tuition fee.

SCHOOL OF ENGINEERING

FOREWORD

Graduate work in engineering is available on a late afternoon, early evening basis. This schedule of offerings will be continued and additional day classes will be scheduled in the future. Likewise, the course offerings and degree programs will be enriched and expanded as time passes and the needs of students can be met. This program is designed primarily for two broad categories of students: (1) those who are professionally employed on a full-time basis in the area and who wish to pursue further study; and (2) recent graduates who wish to increase their mastery of the field by doing advanced work. Specific programs in some or all of the several engineering disciplines—chemical, civil, electrical, industrial, management, mechanical, sanitary, etc.—will be developed in the future as the needs of students are recognized and as the resources of the University will permit.

The general objective of the School of Engineering is identical with the purpose of the University of Dayton in meeting its objective of serving the community and fulfilling its motto, *Pro Deo et Patria.* The specific purpose of the graduate program in engineering is to provide the best possible education for men and women at the graduate level for enriched careers in engineering. This purpose is achieved by developing those special capacities and capabilities of the student which enable him to become a thoroughly competent professional in his chosen field.

The program leading to the Master of Science in Engineering degree is designed primarily to meet the basic needs of the engineer in a changing world. Major emphasis is placed upon rigorous study of the engineering sciences in order to improve the individual's competence to deal with the increasingly complex body of knowledge underlying all engineering design, development, and research. Such emphasis also tends to increase the breadth of his fundamental knowledge and give him a greater flexibility and adaptability in dealing with tomorrow's unknowns. To this end emphasis is placed upon the problems common to all engineering disciplines. It is hoped that with this program the School of Engineering may lead the individual to his highest level of scholarship and stimulate him to achieve a genuine personal and professional maturity.

RESEARCH FACILITIES

The facilities for research at the University of Dayton are administered by the "academic departments" and the University of Dayton Research Institute.

Some of the more important research facilities are one medium- and two large-scale digital computers, analog computer facilities and a sub-critical nuclear reactor.

GRADUATE APPOINTMENTS

Industrial Fellowships and certain special research grants are available at the University of Dayton for the encouragement of graduate work and the promotion of research.

GRADUATE STUDY BY MEMBERS OF THE STAFF

Any member of the research or instructional staffs, subject to the approval

of the head of his department or section, may carry not more than six credits of graduate work per semester.

Staff members holding the rank of professor or associate professor cannot become candidates for degrees from this institution. Staff members holding the rank of instructor or assistant professor may become candidates for degrees with the approval of the Dean of Engineering.

ADMISSION

1. Procedure:

a. All students desiring admission to the graduate program of the School of Engineering must file a formal Application for Admission to Graduate Study in Engineering. This form may be secured from and must be returned to:

Chairman, Graduate Study Committee
School of Engineering
Room 201, St. Mary's Hall
University of Dayton
Dayton 9, Ohio

b. Application for admission normally will require the following procedure:

(1) Fill out the Application for Admission to Graduate Study in Engineering completely and return it to the office of the Chairman, Graduate Study Committee.

(2) Furnish a transcript or transcripts of all undergraduate and graduate work pursued previously. Transcripts must be mailed directly by the Registrar of the institution where the work was done to the Chairman, Graduate Study Committee.

(3) Supply three letters of recommendation from persons qualified to judge the candidate as a prospective graduate student. These should be mailed directly to the Chairman, Graduate Study Committee.

(4) When requested, submit scores on the general aptitude and major subject sections of the Graduate Record Examination.

(5) When from outside the United States, supply evidence of an adequate command of English, sufficient finances, and certification of health.

(6) Have all this information in the office of the Chairman, Graduate Study Committee, by August 15 for fall semester admission, and by January 1 for the spring semester. It is the responsibility of the student that his application with all the necessary supporting documents be complete and in order before the specified date to be admitted to regular status.

2. Qualifications:

There are certain basic requirements which must be met by all applicants. These include the following:

a. Bachelor's degree in engineering from an institution having curricula accredited by the Engineers' Council for Professional Development.

b. A cumulative grade point average of 3.00 for the last two years of undergraduate curriculum. This is based upon a grading system in which A = 4.00.

c. Exceptions to the above requirements will be considered on an indi-

vidual basis by the Graduate Study Committee of the School of Engineering.

TIME LIMIT

The program must be completed within five years after admission to candidacy. (Period of service in the armed forces is not included.)

PLANNING GRADUATE STUDY

The major objectives of graduate study are scholastic competence, independence and maturity of thought. The student must accept responsibility for his own education and should master those aspects of learning which will give him confidence in his own judgments.

THE MASTER'S PROGRAM IN ENGINEERING

The Dean of the School of Engineering will appoint a student advisory committee for each Regular Student admitted to graduate study. Working with this committee, each student will develop a program of study which is deemed best for his particular interests and objectives and which is recommended by the committee chairman. The student then must file this program of study with and secure the approval of the Graduate Study Committee of the School of Engineering.

1. Credits:

Each program of study must include a minimum of 33 credit hours consisting of:

a. 6-9 credit hours in Basic Sciences;
b. 12 credit hours in Engineering Sciences;
c. 3 credit hours in Philosophy;
d. 3-6 credit hours in Thesis Related Topics approved by the student's advisory committee;
e. 6 credit hours on an approved thesis project.

A graduate student may not change from one major to another without written permission from the Graduate Study Committee, School of Engineering, and the Dean of Engineering.

2. Courses:

a. Basic Sciences
6-9 credit hours selected from the following courses:

MTH 421	PHY 505	CHM 508
MTH 422	CHM 507	

b. Engineering Sciences:
12 credit hours selected from the following courses:

EGR 501 Applied Elasticity ..... 3 credit hours
EGR 502 Mechanics of Fluids ..... 3 credit hours
EGR 503 Thermodynamics ..... 3 credit hours
EGR 504 Mass and Energy Transport ..... 3 credit hours
EGR 505 Properties of Materials ..... 3 credit hours
EGR 506 Solid State Devices ..... 3 credit hours

c. Philosophy
EGR 522 Phil. Found. of Eng. ..... 3 credit hours

d. Thesis Related Courses:

3-6 credit hours in courses approved by the student's advisory committee.

e. Thesis:
6 credit hours on an approved research project.

3. Comprehensive Examination and Admission to Candidacy:

The student must satisfactorily pass a comprehensive examination before he is granted admission to candidacy for the degree. The examination may be written, oral or both. This examination may be taken after the student has completed 18 or more credit hours of graduate class work with a cumulative grade point average of 3.00 or better. The student's advisory committee administers the examination.

4. Application for Admission to Candidacy:

An application for comprehensive examination and admission to candidacy may be obtained from the Office of the Dean of Engineering. This form must be filled out and filed in that office at least four weeks prior to the date requested for the examination.

5. Thesis:

Presentation of a thesis is required of all candidates. Joint authorship is not permitted. Copies of the completed thesis must be in the hands of the student's advisory committee and the librarian for approval two weeks prior to the date fixed for the final oral thesis examination. After the final oral examination, two complete and approved typewritten copies of the thesis shall be deposited with the librarian. These copies of the thesis must be deposited not less than two weeks prior to commencement. A charge of $10.00 will be made to cover library costs and binding.

The student should consult the University of Dayton Thesis Manual, prepared for use of students in the Engineering Graduate School, before arranging for the typing of his thesis.

6. Final Oral Thesis Examination:

An application for final oral thesis examination may be obtained from the Office of the Dean of Engineering. This form should be filled out and signed by the Chairman of the student's advisory committee and filed in the Office of the Dean of Engineering at least two weeks prior to the date requested for the oral examination.

7. Degrees:

The School of Engineering at the present time offers one graduate program of study leading to the degree Master of Science in Engineering. The requirements for this degree are outlined as follows:

a. Obtain admission to candidacy.
b. Complete a prescribed program of study with a minimum of 33 credit hours of which at least 24 credit hours must be with grades of "A" or "B."
c. Earn a cumulative grade point average of 3.00 or better.
d. Submit an acceptable thesis.
e. Satisfactorily pass an oral thesis examination.

In fulfilling the requirements for the degree, certain specific conditions

prevail and should be noted carefully by the student. These are itemized as follows:

a. Credits in Transfer
Transfer credit is determined on an individual basis by the committee charged with this responsibility.

b. Course Load
Any person who is not a full-time student may register for more than six credit hours per semester only with permission of the Graduate Study Committee.

c. Use of Advanced Undergraduate Courses
Certain undergraduate level courses may be used if approved by the student's advisory committee.

DEPARTMENTS OF INSTRUCTION

BIOLOGY (BIO)

Chairman: Dr. Paul Machowicz, S.M.

The courses marked with an asterisk are intended primarily for graduate students in Education. Prerequisite for enrolling in any of these courses for credit toward the M.S. in Education degree is standard teacher certification in the field of Biology.

***BIO 303 Physiology** — **3 credit hours**

Prerequisites: BIO 101-2, CHM 123-4 or equivalent, CHM 313-314 recommended.

***BIO 303L Physiology Lab (3 clock hrs.)** — **1 credit hour**

Course to accompany BIO 303 lecture. *Prerequisites:* BIO 101-102, General Biology, CHM 123-124, General Chemistry or CHM 110 or equivalents.

***BIO 312 General Genetics** — **3 credit hours**

Prerequisites: BIO 101-2 and MTH 121.

***BIO 312L General Genetics Lab (2 clock hrs.)** — **1 credit hour**

Course to accompany BIO 312. *Prerequisites:* BIO 101-102, MTH 107, College Algebra or MTH 121 or equivalents.

***BIO 316 Plant Morphology** — **2 credit hours**

Prerequisites: BIO 101-102 and BIO 220.

***BIO 316L Plant Morphology Lab (2 clock hrs.)** — **1 credit hour**

Prerequisite: A course in General Botany.

BIO 320 Evolution — **3 credit hours**

***BIO 324L Entomology Lab (2 clock hrs.)** — **1 credit hour**

Prerequisite: Biology or Zoology one year.

***BIO 324L Entomology Lab (2 clock hrs.)** — **2 credit hours**

Course to accompany BIO 324 lecture.

BIO 325 Parasitology — **2 credit hours**

BIO 325L Parasitology Lab — **1 credit hour**

Course to accompany BIO 325.

BIO 330 Plant Physiology — **3 credit hours**

Prerequisite: BIO 220 General Botany.

BIO 330L Plant Physiology Lab — **1 credit hour**

A course to accompany BIO 330.

***BIO 361 Invertebrate Zoology** — **2 credit hours**

Prerequisites: BIO 101, 102.

***BIO 361L Invertebrate Zoology Lab** — **2 credit hours**

Course to accompany BIO 361 lecture.

BIO 501 Seminar — **1 credit hour**

Practice in development, presentation, and discussion of papers dealing with Biological problems. Open only to advanced undergraduate and graduate Biology Majors.

BIO 503 Advanced Genetics — **3 credit hours**

An analysis of the nature of the gene and gene action. The course will review

recent advances in biochemical and physiological genetics, cytogenetics, population genetics and radiation genetics. The laboratory sessions will deal with design and analysis of experiments in quantitative genetics and estimation of components of variance due to genetic and non-genetic causes.

***BIO 504 BIO-Lab Techniques** **3 credit hours**

The course will be devoted to the presentation of methods of collecting, preserving and preparing biological materials for classroom use. The course is also designed to acquaint teachers with lecture demonstration skills and laboratory techniques applied to the biological sciences. Open only to graduate students registered in the Master Teacher Program.

BIO 505 Protozoology **3 credit hours**

A study of the protozoa, their structure and physiology, their importance in experimental biology and their relation to other micro-organisms.

BIO 507 Endocrinology **3 credit hours**

A functional analysis of the mechanism and activity of the endocrine system. Emphasis will be placed on hormonal regulation of metabolism and growth.

***BIO 508 Field Biology** **3 credit hours**

The course is designed to acquaint the student with the local flora and fauna. Field trips will be used to apply techniques in the observation and study of organisms in their natural environment. Relationships between organisms and their environment as well as some aspects of limnology will be stressed.

BIO 511 Cellular Physiology **3 credit hours**

Basic concepts of the structure, physiology and bio-chemistry of cells and subcellular particulates will be studied. Emphasis will be placed on the mechanisms of energy transfer in living cells, membrance phenomena and enzyme activity.

BIO 513 Mycology **3 credit hours**

Biology of the fungi and slime molds. Lectures will deal with the taxonomy, morphology, cytology, physiology and genetics of the fungi. Laboratory work will deal with morphological, pure culture and experimental work with the fungi.

BIO 515 Bacterial Physiology **4 credit hours**

A study of the metabolic and biosynthetic activities of bacteria; how they affect their environment and how it influences them. To be accompanied by a laboratory period designed to familiarize the student with some of the basic biochemical techniques used in the study of bacterial physiology. *Prerequisites:* BIO 411 and biochemistry, or the consent of the instructor.

***BIO 520 Principles of Biology** **3 credit hours**

This course is specifically designed as an introduction to modern biology. This is a background course open only to graduate students registered in the Master Teacher Program.

BIO 590 Pro-Seminar or PHL 505 **3 credit hours**

The relevance of science to all other knowledge; problems dealing with the interrelations of science, Philosophy, Education and Government. (May be replaced by PHL 505.)

BIO 599 Thesis **3-6 credit hours**

CHEMISTRY (CHM)

Chairman: Dr. Cletus Chudd, S.M.

The courses marked with an asterisk are intended primarily for graduate students in Education. Prerequisite for enrolling in any of these courses for credit toward the M.S. in Education degree is standard teacher certification in the field of Physical Science or in Chemistry.

***CHM 412 Intermediate Organic Chemistry** **3 credit hours**
Prerequisite: One year of Basic Organic Chemistry

***CHM 417 Inorganic Chemistry** **3 credit hours**
Prerequisite: CHM 215-216 Quantitative Analysis, or the equivalent.

***CHM 501 Principles of Chemistry I** **3 credit hours**
The subjects treated in this course are: atomic structure, chemical bonding, chemical equilibrium, inorganic nomenclature, theory of solutions, acid-base concepts, periodic properties of the elements, radiochemistry and nuclear reactions. *Prerequisite:* One year of College Chemistry.

***CHM 502 Principles of Chemistry II** **3 credit hours**
The subjects treated in this course are: thermodynamics, chemical kinetics, redox reactions, organic chemistry (nomenclature, functional groups, preparation and properties or organic compounds). *Prerequisite:* CHM 501.

CHM 503-504 Advanced Inorganic Chemistry **6 credit hours**
Current views on atomic theory and atomic structure, chemical bonding, periodic properties of the elements, inorganic nomenclature, coordination compounds, acid-base systems, nuclear chemistry, properties and compounds of families of elements.

CHM 505-506 Advanced Organic Chemistry **6 credit hours**
Molecular orbital and resonance theories, conformational analysis, stereochemistry, correlation of molecular structure with physical and chemical properties, reaction mechanisms, heterocyclic chemistry.

CHM 507-508 Advanced Physical Chemistry **6 credit hours**
Classical thermodynamics with emphasis on non-ideal systems and chemical reactions. Introductory quantum theory, chemical bonding and the structure of molecules. Chemical kinetics, empirical kinetics and reaction mechanism, absolute reaction rate theory.

CHM 510 Pro-Seminar **3 credit hours**
The impact of Chemistry on present-day society: sociological, economical, and ethical factors.

CHM 511 Biochemistry **3 credit hours**
Review of structure of carbohydrates, lipids and proteins, followed by the metabolic path of each group. Energy metabolism, inorganic metabolism and enzyme systems will also be treated.

CHM 512 Special Techniques in Biochemistry **3 credit hours**
This course comprises the study of cellular respiration enzyme kinetics, chemical and physical methods of biochemical analysis, and the use of radioisotopes in metabolism by means of special equipment such as the Warburg microrespirometer, recording spectrophotometer, recording oxygen cathode, fluorometer, high speed centrifuge, paper electrophoresis, and radioisotope scintillation tube with attached scaler.

CHM 514 Advanced Analytical Chemistry **3 credit hours**
Theoretical topics of analytical Chemistry, particularly as applied to electrical and optical methods of instrumental analysis.

CHM 520-521 Research **6 credit hours**

ECONOMICS (ECO)

Chairman: Dr. Edmund B. O'Leary

Prerequisite for enrolling in any of the following courses for credits toward the M.S. in Education degree is "ECO 201-202 Principles of Economics" or the equivalent.

ECO 501 Advanced Principles of Economics **3 credit hours**
A review and analysis of the fundamental principles underlying the economic system.

ECO 503 History of Economic Doctrine **3 credit hours**
Development of economic concepts and theories from the Mercantilists to the present period.

ECO 505 Consumer Economics **3 credit hours**
A study of the economic forces which influence the consumer in his choice and use of goods and services; and of the public and private agencies which afford protection, information, and assistance to the consumer.

ECO 507 Current Economic Problems **3 credit hours**
An analysis and discussion at an advanced level of current economic issues and problems.

ECO 520 Economics of Government **3 credit hours**
A survey of government and business relationships in the American economy and the impact of government on private enterprise.

ECO 525 Graduate Seminar in Economics **3 credit hours**
Special studies and discussions of economic problems and trends.

EDUCATION (EDU)

Chairman: Dr. Louis J. Faerber, S.M.

EDU 325 Social Studies in the Elementary School **3 credit hours**

EDU 431 Visual and Other Sensory Aids in Education **2 credit hours**

EDU 435W Arithmetic in Intermediate & Upper Grades—Level Two **3 credit hours**
This workshop deals with the individualized arithmetic program in grades, 4, 5, 6, 7, 8. It is designed for those who have completed a Level One workshop or the equivalent.

EDU 448 Psychodynamics of Behavior **3 credit hours**
Prerequisites: This course replaces the previous prerequisites of Mental Hygiene and Abnormal Psychology for the Guidance and Counseling Program; students who have already completed this dual requirement on the undergraduate level should not take this course.

EDU 451W Advanced Kindergarten-Primary Instruction **3 credit hours**
Prerequisite: EDU 450W Kindergarten-Primary Instruction or other Kindergarten Methods course.

EDU 480 The Psychology of Slow Learning Children **2 credit hours**
Enrollment limited to teachers with positions (or prospective positions) in special education.

EDU 484 Language Arts for Slow Learning Children **2 credit hours**
Prerequisite: EDU 480.

EDU 485 Social Studies for Slow Learning Children **2 credit hours**
Prerequisite: EDU 480.

EDU 486 Arithmetic for Slow Learning Children **2 credit hours**
Prerequisite: EDU 480.

EDU 487 Occupational Orientation and Job Training **2 credit hours**
A course in special education for teachers of slow learning children. *Prerequisite:* EDU 480.

EDU 500W Mathematics in Elementary Grades **2 credit hours**
A graduate workshop designed to produce college teachers and school supervisors of the Individualized Arithmetic Program. Demonstration of how the logical patterns of mathematical thought which are inherent in arithmetic can be readily acquired by pupils.
Prerequisite: Completion of a Level One Workshop, one year's experience in teaching the Individualized Arithmetic Program, and the imminent prospect of teaching the Individualized Arithmetic Program to teachers.

EDU 501 Advanced Educational Psychology **3 credit hours**
Current concepts of learning and development with emphasis on the learning process.

EDU 502 Comparative Philosophies of Education **3 credit hours**
The historical development of educational philosophies. Evaluation of major current philosophies. Significant problems of the present day in educational philosophy.
Prerequisite: EDU 419 Philosophy of Education, or equivalent where the student has already achieved a norm for evaluating the theories of modern education.

EDU 503 Research Methodology and Statistics **3 credit hours**
Comprehension of educational statistics and terminology of research. Major techniques and methods of research for intelligent consumption. Specific techniques and guides for efficiently locating research on a given problem, reading critically, and drawing logical inferences. (The student will here be expected to initiate plans for an acceptable Field Project.)

EDU 504 Advanced Child and Adolescent Psychology **3 credit hours**
Deals with the principal areas of growth and development through adolescence with special emphasis on mental development. Required of students following the School Guidance and Counseling Program.

EDU 506 School Administration **3 credit hours**
General principles governing the administrative functions of planning, organizing, and controlling are presented and applications are made in the administration of both elementary schools and secondary schools.

EDU 507W The Principalship of the Catholic Elementary School **2 credit hours**
This workshop seeks to apply the principles of administration to the Catholic Elementary School. Particular attention is placed upon human relationships, in-service education of the professional staff, securing community participation in school policy formation, pupil personnel problems, curriculum development, and managerial responsibilities of the principal. *Prerequisite:* Admission to graduate standing in the School of Education.

EDU 509 School Supervision **3 credit hours**
A course in planning, organizing, and administering instructional supervision in public and private (parochial) school systems. Field observation required.

EDU 511 Elementary School Curriculum **2 credit hours**
A fundamental course in curriculum development designed to prepare the student for effective participation in cooperative efforts to improve the curriculum. Attention is directed to curriculum issues and to desirable instructional practices in the major areas of curriculum.

EDU 512 Secondary School Curriculum **2 credit hours**
A fundamental course in curriculum development designed to prepare the student for effective participation in cooperative efforts to improve the curriculum. Attention is directed to curriculum issues and to desirable instructional practices in the major curriculum areas.

EDU 513 Elementary School Evaluation **2 credit hours**
Centers attention on systematic, total school self-evaluation as the basis for school improvement programs.

EDU 514 Secondary School Evaluation **2 credit hours**
Centers attention on systematic, total school self-evaluation as the basis for school improvement programs.

EDU 515 School Law **2 credit hours**
Problems in school administration which may give rise to court action. Ohio school law will be emphasized.

EDU 517 School Finance **2 credit hours**
A course for school administrators covering principles of school finance, technical problems of budgeting, source of income, purchasing, accounting, and debt service.

EDU 518 School and the Social Order **3 credit hours**
The relationship of school to the total cultural pattern and the development of interaction between school and community are appraised and concrete suggestions are presented. The nature of the individual child and his relations with society and culture; the special culture of the school and its accompanying social world; school, teacher, and community relations.

EDU 519 Principles of Guidance **2 credit hours**
An introduction to the scope and aims of guidance; an introductory treatment of the basic guidance services and how the counselor and the teacher can make efficient use of them.

EDU 521 School Public Relations **2 credit hours**
Covers philosophy and techniques of school-community relations for educational leaders. Attention given to parent contacts, citizens' participation, press, radio, television, printed material and other media.

EDU 523 Occupational Information and Community Resources **2 credit hours**
Selection, utilization, and evaluation of educational and occupational information materials. Familiarization with standard labor market data and resources of the local community.

EDU 527W Business Systems and Data Processing **3 credit hours**
A graduate workshop in business automation, related procedures, and equipment. Designed to develop a program of approach the secondary schools can use in educating students in office automation and business data processing. Explanation of the Cooperative Office Education Program of the Department of Education, State of Ohio, is included. This workshop fulfills a requirement for COE certification.
Prerequisite: High School Certification in Business Education.

EDU 530 Psychology of Individual Differences **2 credit hours**
Nature, extent, and significance of variability; hereditary and cultural influences; theories of intelligence; trait organization; group differences.

EDU 533. Psychometrics **3 credit hours**
Lectures and demonstrations in the principles and application of psychological measurement, with particular emphasis on standardized group tests of intelli-

gence and scholastic achievement, interest tests, personality tests, and other areas pertinent to the guidance function. Practicum in test selection, use, and interpretation.
Prerequisites: EDU 448, 503. *Recommended:* EDU 519.

EDU 534 Interpretation of Individual Tests **2 credit hours**

Intensive study of major theoretical problems concerning the use and interpretation of individual psychological tests. Particular attention is devoted toward interpretation of the Standford-Binet, Wechsler Intelligence Scale for Children, the Bender Gestalt, and projective techniques. Emphasis is placed upon use of individual test results in the counseling program.
Prerequisite: EDU 533.

EDU 539 Administration of a School Guidance Program **2 credit hours**

Planning, developing and administering school testing and guidance services and group guidance in the homeroom. This course covers also such matters as in-service training of guidance personnel, facilities, supplies, assembling and disseminating educational and occupational information, and liaison with both teachers and school administrators.

EDU 541 Cast Studies in School Guidance and Counseling **2 credit hours**

Supervised experiences in typical school guidance policies and practices. Such experience will include: vocational guidance, educational guidance and curriculum structures, cumulative folder, interpretations, counseling procedures.

EDU 543 Principles and Techniques of Counseling **3 credit hours**

Basic theories, principles and techniques of counseling. A consideration of directive, non-directive and eclectic techniques as a function of the intelligence and grade-level of the child. Ethical considerations.
Prerequisites: EDU 448, 503, 533. *Recommended:* EDU 519.

EDU 544 Practicum in Counseling Techniques **2 credit hours**

Supervised experience in counseling, using role-playing and actual counseling cases. Both group and individualized instruction and supervision. Guidance Center facilities will be utilized as a training center.
Prerequisites: EDU 448, 503, 519, 533, 543. *Recommended:* EDU 523.

EDU 547 Psychology of Exceptional Children **2 credit hours**

Deals with the intellectual deviate, the socially and emotionally maladjusted. Concentration on educational guidance for the gifted and the mentally retarded.
Prerequisites: EDU 448, PSY 306 or EDU 207.

EDU 550 Reading Problems and the Guidance Program **2 credit hours**

Understanding the nature of the problem. Practicum in diagnostic and remedial reading.
Prerequisite: EDU 519.

EDU 551, 552, 553, 554, 555, 556 Child Study Project **1 credit hour**

An in-service project in schools under the supervision of the Tipp City Exempted Village Schools and the Tipp City Superintendent. One graduate credit per semester with a maximum of six credits in this series. These courses involve the direct study of children throughout the school year. Each participant gathers a wide body of information about a pupil, presents the accumulated data from time to time to the study group for underlying the child's behavior, learning, and development. Provides opportunity for teachers in service to earn credit for participation in their own local child study group. The study group sessions meet 18 times a semester. (These projects must be registered for in sequence and they yield one semester hour per project per semester.)

EDU 558W Child Study Leadership Workshop **2 credit hours**

This workshop is designed to train teachers and school counselors for leadership roles in the Child Development Laboratory as conducted within approved school systems. It is in cooperation with the University of Maryland's sponsored Institute for Child Study.

Provides training to persons who plan to participate as group members or leaders in the Child Study Program sponsored by the Institute. The workshop will provide suitable experience in its own right for persons whose role in schools can be enhanced through deeper understanding of children and youth, e.g., area principals.

EDU 560 Library Guidance for Teachers **2 credit hours**

Trains the teacher to make use of the available services and resources of the standard school library in behalf of a well-rounded education for pupils. Acquaints the class with library organization, reference material, indexes, and bibliography. Not designed for teacher-librarians.

EDU 561W Community Resources in Elementary Teaching

This workshop aims to give elementary teachers background for their teaching (particularly in the social studies area) by taking them behind the scenes in local government, social agencies, key industrial plants, and historical sites. Dayton and the Miami Valley will be the laboratory.

EDU 562 School Provisions for Individual Differences **3 credit hours**

Studies the different traits and abilities of pupils and ways whereby teaching might be adjusted to these differences. Special attention focused on the slow learner, the gifted student, and the educationally retarded child.

EDU 563 Diagnosis and Remedial Reading **3 credit hours**

A study of the major factors associated with reading difficulties, techniques that might be used to diagnose the nature and causes of pupil difficulty, and the methods by which remedial adjustments can be made. Demonstrations and directed observation of teaching.

Prerequisite: EDU 303 Reading in the Elementary School or 320 Reading and Language Arts in Elementary School.

EDU 564 Advanced Science in Elementary School **3 credit hours**

This workshop is designed to train elementary school teachers to integrate science with all phases of the curriculum—by research projects in the basic areas of astronomy, biology, chemistry, geology, physics, and air-age education. Teachers also have the opportunity to study and evaluate the visual aids now available in the field of science.

Prerequisite: EDU 460W Science in the Elementary School or another college course in physical science.

EDU 565 Group Techniques in the Classroom **3 credit hours**

A comprehensive study will be made of classroom grouping in both primary and intermediate areas of the elementary school. A practical approach is planned for the study of all phases of grouping; initial class appraisals, deciding individual needs, class grouping, manipulation of social differences, and planning for effective group instruction; homogeneous and heterogeneous grouping; also a unique plan of random grouping will be presented.

EDU 566W The Education of Gifted Children **2 credit hours**

The workshop will deal with formal and informal methods of identifying giftedness, the potentials and problems of the gifted, assessment of special school programs, and positive provisions for the instructional program.

EDU 590 Field Project **3 credit hours**
An on-the-job research project that investigates a problem that stems from an actual need for the purpose of effecting improvement of either one's own professional practice or of the school setting in which the investigator works. It is accompanied by a seminar session on the campus held once a week.
Prerequisite: Admission as a candidate for a degree.

ENGINEERING

Dean: Dr. Maurice R. Graney

CHEMICAL ENGINEERING (CME)

CME 501 Advanced Thermodynamics **2 credit hours**
Advanced topics of thermodynamics with applications.
Prerequisite: CME 303 *or equivalent.* (Open for enrollment of undergraduate students.)

CME 502 Fluid Flow **2 credit hours**
A study of compressible and incompressible flow with applications.
Prerequisite: CME 311 *or equivalent.* (Open for enrollment of undergraduate students.)

CME 503 Advanced Unit Operations **2 credit hours**
This course covers diffusional topics, including extraction and multi-component absorption.
Prerequisite: CME 312 *or equivalent.* (Open for enrollment of undergraduate students.)

CME 504 Heat Transmission **2 credit hours**
A study of the basic concepts of the flow of heat by conduction, convection and radiation.
Prerequisite: CME 311 *or equivalent.* (Open for enrollment of undergraduate students.)

CIVIL ENGINEERING (CIE)

CIE 502 Prestressed Concrete **3 credit hours**
Discussion of the properties of concrete and prestressing steel. Theory and design of prestressed concrete beams, slabs, circular tanks and rigid frames.
Prerequisite: CIE 407. (Open for enrollment of undergraduate students.)

CIE 504 Limit Design in Steel **3 credit hours**
A review of the physical properties of metal, the theory and application of limit design to simple and redundant members, trusses, and columns. A brief study of connection details.
Corequisite: CIE 406. (Open for enrollment of undergraduate students.)

CIE 506 Ultimate Design of Reinforced Concrete **3 credit hours**
The theory and application of ultimate design in reinforced concrete as applied to the sections of beams, columns and members subject to both bending and direct stress. The latest report of the A.S.C.E.-A.C.I. Joint Committee is reviewed.
Prerequisite: CIE 407. (Open for enrollment of undergraduate students.)

CIE 524 Foundation Design **3 credit hours**
Analysis of earth pressure and stability of natural slopes. Study of frost action, permafrost. The design of spread foundations, pile foundations, caissons, cofferdams, anchored bulkheads, bridge piers and abutments.
Prerequisite: CIE 409; *Corequisite:* CIE 407. (Open for enrollment of undergraduate students.)

CIE 542 Highway Design I **3 credit hours**
Design and construction of pavements, including concrete, asphalt, aggregate and soil cement surfaces. Designs of base courses. Maintenance.
Prerequisite: CIE 405. (Open for enrollment of undergraduate students.)

CIE 544 Traffic Engineering **3 credit hours**
Characteristics of traffic, including the road user, the vehicle, origin, and destination surveys. Traffic regulation, control devices and aids, design, administration and planning.
Prerequisite: CIE 405. (Open for enrollment of undergraduate students.)

ELECTRICAL ENGINEERING (ELE)

ELE 502 Advanced Circuit Analysis **3 credit hours**
Poles and zeros of polynominal functions and networks. Numerical procedures. Chebyshev and Taylor approximations to brick wall functions. Elementary and modern synthesis. Low pass and band pass amplifiers. Feedback amplifiers and stability.
Prerequisites: ELE 413, MTH 341. (Open for enrollment of undergraduate students.)

ELE 503 Analog Computers **3 credit hours**
The discussion and analysis of linear electrical computing elements in conjunction with electronic differential analysis. The utilization of electrical and electronic circuits for the performance of linear operation, for multiplication and division, and for function generation. Use of differential analyzers for solving linear integral-differential equations, simultaneous linear algebraic equations, and non-linear differential equations.
Prerequisite: ELE 313, MTH 342. (Open for enrollment of undergraduate students.)

ELE 504 Digital Computers **3 credit hours**
Digital computers and their design. Circuit components and binary numbers. Boolean algebra. The simplification of Boolean functions. Memory element input equations. The derivation of application equations. Digital computer memories. Input-output equipment. The arithmetic unit. Error-free computer operation. The control unit. Completing computer design.
Prerequisite: ELE 313. (Open for enrollment of undergraduate students.)

ELE 511 Advanced Theory and Design of Rotating Machinery I **3 credit hours**
Basic principles and applied theory in practical design of induction machinery, commercial, aircraft and missile types.
Prerequisite: ELE 403. (Open for enrollment of undergraduate students.)

ELE 512 Advanced Theory and Design of Rotating Machinery II **3 credit hours**
Detailed theory and design of direct current and synchronous machines. Permanent magnet and flux switch machines. Heat transfer phenomena; the general temperature field.
Prerequisite: ELE 511. (Open for enrollment of undergraduate students.)

ENGINEERING (EGR)

EGR 501 Applied Elasticity **3 credit hours**
Equations of equilibrium and continuity. Solution of two-dimensional problems in rectangular and curvilinear coordinates by means of stress functions. St. Venant's principle, energy methods, stress concentrations, introduction to three-dimensional and thermal stress problems, application of finite difference equations.
Prerequisite: EGM 304.

EGR 502 Mechanics of Fluids **3 credit hours**
Fluid properties, important differential equations in fluid flow, laminar and turbulent flow, boundary layer flow, introduction to compressible flow.

EGR 503 Thermodynamics **3 credit hours**
Thermodynamic concepts; the laws of thermodynamics; kinetic theory of gases; introduction to the Maxwell-Boltzmann statistics and their applications.

EGR 504 Mass and Energy Transport **3 credit hours**
Basic concepts, principles and definitions, rate equations, thermodynamic principles, applications.

EGR 505 Properties of Materials **3 credit hours**
Structure, properties, and behavior of materials. Conductivity, diffusivity, electro-chemistry, elasticity, plasticity, fracture, viscosity.

EGR 506 Solid State Devices **3 credit hours**
Introduction to the theory of solid state devices. Electron emission devices, semi-conductor devices, dielectric devices, and magnetic devices. Mathematical technique beyond differential equations will be developed as needed.

EGR 512 Reliability **3 credit hours**
Application of statistical theory to the design of reliability systems in the broadest sense. Theory behind, and techniques to be used in designing testing methods and procedures for determining reliability of component parts and total systems. Environmental test design. Statistical analysis of, and inference from test results.
Prerequisite: MTH 331.

EGR 513 Systems Analysis, Design & Evaluation **3 credit hours**
A total systems approach to problem solving. This course considers techniques which treat quite sophisticated and difficult problems. Proofs and the characteristic rigor of mathematics are avoided but the essential subtlety of the techniques remain. This course relates mathematical courses on the one hand and applied engineering courses on the other.
Prerequisite: EGR 512.

EGR 516 Modern Electron Devices **3 credit hours**
Attention is directed toward late developments in electronic devices exclusive of transistors and conventional electron tubes. Some specific topics include low noise traveling wave tubes, parametric amplifying devices, and several devices from the area of quantum electronics. Stress is placed on basic physical principles and theory of operation.
Prerequisites: MTH 421, MTH 422, PHY 505 *or equivalent.*

EGR 517 Transport Properties **3 credit hours**
Momentum, energy and mass transport including viscosity and mechanism of momentum transport, thermal conductivity and mechanism of energy transport, diffusivity and the mechanisms of mass transport.
Prerequisites: MTH 421, MTH 422, EGR 504.

EGR 518 Compressible Flow **3 credit hours**
One-dimensional compressible flow, two- and three-dimensional subsonic flow, two-dimensional supersonic flow, mixed flow, and flow of real gases with viscosity and heat conductivity.
Prerequisites: MTH 421, MTH 422, EGR 502.

EGR 519 Analytic Dynamics **3 credit hours**
Kinematics, relative motion, constraints and generalized coordinates, Hamil-

ton's principle, Lagrange's equations, variational principles. Applications to particle dynamics and rigid body motion.
Prerequisites: EGM 301, MTH 301.

EGR 520 Advanced Structural Analysis **3 credit hours**
Methods of moment-areas, slope-deflection, moment distribution, column analogy, and virtual work. Includes consideration of such problems as frames of variable cross section, plates and shells, and space frames.
Prerequisites: CIE 407, EGM 304.

EGR 521 Theoretical Soil Mechanics **3 credit hours**
General principles involved in the theories of soil mechanics. Discussion includes stress conditions for failure, active and passive pressure, plastic equilibrium in a semi-infinite mass, bearing capacity, semi-infinite elastic solids and subgrade reaction.
Prerequisite: CIE 409.

EGR 522 Philosophical Foundations of Engineering **3 credit hours**
The place of engineering and the engineer in present day society. The philosophical bases for engineering enterprise and the meaning of engineering achievement. (May be replaced by PHL 505.)

EGR 599 Graduate Engineering Thesis **0 to 6 credit hours**
Students engaged in thesis research must enroll for this course for a total of six credit hours.

ENGINEERING MECHANICS (EGM)

EGM 501 Experimental Stress Analysis **2 credit hours**
A study of the experimental analysis of stress as an aid to design for strength and economy with emphasis on electrical strain gages. Also covered are photoelasticity, brittle coatings, photoelastic coatings, analogies, structural similitude.
Prerequisite: EGM 304, *Corequisite:* EGM 501L.

EGM 501L Experimental Stress Analysis Laboratory **1 credit hour**
Experiments and problems to acquaint the student with the basic techniques of the use of strain gages, photoelasticity, and brittle coatings in stress analysis.
Corequisite: EGM 501.

ENGLISH (ENG)

Chairman: Dr. Bernard J. Bedard

Prerequisite for enrolling in any of the following courses for graduate credit toward the M.S. in Education degree is teacher certification in English with at least 24 sem. hrs.

ENG 403 History of the English Language **3 credit hours**
ENG 405 Chaucer **3 credit hours**
ENG 412 Early Renaissance Literature **3 credit hours**
ENG 413 Later Renaissance Literature **3 credit hours**
ENG 420 Renaissance Drama **3 credit hours**
ENG 423 Tragedies of Shakespeare **3 credit hours**
ENG 424 Comedies of Shakespeare **3 credit hours**
ENG 425 Histories of Shakespeare **3 credit hours**
ENG 428 Literary Criticism **3 credit hours**
ENG 431 Milton **3 credit hours**
ENG 434 Age of Wit and Satire **3 credit hours**

ENG 435 Eng. Literature of the 18th Century **3 credit hours**
ENG 437 The English Novel **3 credit hours**
ENG 438 The Age of Romanticism **3 credit hours**
ENG 441-442 The Victorian Age **3 credit hours**
ENG 445 Modern British Fiction **3 credit hours**
ENG 446 Modern British Poetry **3 credit hours**
ENG 450 19th Century American Poetry & Prose **3 credit hours**
ENG 452 American Fiction of the 19th Century **3 credit hours**
ENG 454 Modern American Fiction **3 credit hours**
ENG 456 Modern American Poetry **3 credit hours**
ENG 490 Seminar **3 credit hours**

ENG 501 English Prose Style **3 credit hours**
A study of representative selections of English prose. It includes an investigation of the complementary arts of composition and rhetoric as seen in the writings of the master authors of English prose.

ENG 510 Special Problems in Literary Criticism **3 credit hours**
A study of the possible critical approaches to works of non-dramatic poetry suitable for study on the secondary school level. Specific works to be discussed will be determined by the needs of the class.

ENG 520 Shakespeare I **3 credit hours**
A study of the tragedies of Shakespeare. All the tragedies are read; some are taken through in detail in the lecture periods and the rest are assigned for out of class reading. Class discussion is encouraged, and students are tested on the assigned readings.

ENG 521 Shakespeare II **3 credit hours**
A study of the comedies and most important history plays of Shakespeare. The same procedure is followed as in ENG 520.

HISTORY (HST)

Chairman: Dr. Wilfred J. Steiner

Any 300-400 upper level undergraduate course in History may yield graduate credit under the usual conditions.

HST 500 Historiography **3 credit hours**
The course will concentrate on a study of the principal historians and the chief contributions to the development of historical writing as a historical science, with its own method and objectives. Some familiarity with traditional historical methods will be required in the composition of research papers.

HST 501 Greek and Roman Civilization **3 credit hours**
This course seeks to understand life in Ancient Greece and Rome. The method of inquiry is comparison and contrast: first between Athens and Sparta, the focal points of the Hellenic era, and then between the republican and imperial periods of Rome. In each case, Hellenic and Rome, the course probes economic, social, religious, and cultural forces. A general knowledge of Ancient History is *presupposed.*

HST 505 Great African States **3 credit hours**
An intensive study of highly developed civilizations of medieval and early modern Africa. Stress will be placed on the empires of Ghana, Mali, Songhay, Ethiopia and Zanj.

HST 506 Medieval Civilization **3 credit hours**
An interpretation of the culture of the Middle Ages, including Christian thought from St. Augustine to St. Thomas Aquinas, humanism and the classical revival, the rise of vernacular literature, the fine arts, education, and scientific development. A general knowledge of medieval history is *presupposed.*

HST 521 Tudor-Stuart England **3 credit hours**
A study of England—1485 to 1714. For the Tudor period, chief emphasis will be given to the development of the national state, royal absolutism, and the Reformation. The evolution of the constitutional question will be the main theme in the treatment of the Stuart era and Cromwellian Interregnum. The social, economic and cultural aspects of the period, as well as its diplomacy, will be fully covered.

HST 522 Victorian England **3 credit hours**
The study of Great Britain from the Congress of Vienna in 1815 to the end of World War I. The course examines domestic politics, imperial affairs, the Oxford and Evangelical Movements, the Industrial Revolution, the development of Socialism, and major intellectual and cultural currents.

HST 528 Soviet Union since 1917 **3 credit hours**
A comprehensive analysis of Soviet Russia from the Revolution of 1917 to the present day. Concentration will be on the political, economic (including the impact of science and technology), and social aspects of the Soviet nation. Treatment will also be given to the full range of Soviet foreign relations and ideology.

HST 531 The Civilization of the Far East **3 credit hours**
The purpose of this course is to acquaint the High School history teacher with the cultural, religious, social, and economic development of the Far East. The importance of this area in recent world events has given the Far East much greater significance in World History courses. A general knowledge of World History is *presupposed.*

HST 540 Interpretations in World History **3 credit hours**
Specific topics will be chosen for investigation and interpretation as determined by the Instructor. The course will be designed to assist teachers of World History in following recent trends in the interpretation of historical events. A general knowledge of World History is a *prerequisite.*

HST 545 Seminar in Non-American History **3 credit hours**
Discussions; oral and written reports. The topics will depend, in part, upon the intererest of the members of the class.

HST 550 The Philosophy of History **3 credit hours**
The course in the Philosophy of History will be concerned primarily with the speculative historical writing—i.e., the study of the principal philosophers of history beginning with Greek antiquity and including St. Augustine, Hegel, Marx, Spengler, and Toynbee.

HST 552 The American Revolution **3 credit hours**
The course will treat the following topics: the problems of empire-relationships since 1754; the causes, conduct, and consequences of the American Revolution; the postwar problems leading to the adoption of the Federal Constitution.

HST 555 The Immigrant in America **3 credit hours**
A study of the various immigrant groups that combined to establish the distinctive features of American civilization. Attention will be focused on the contributions of the nationality groups in the development of our social, eco-

nomic, political, cultural, and religious institutions. A general knowledge of American History is *presupposed.*

HST 570 The Old South **3 credit hours**
A study of political, social, economic, and cultural history, emphasizing presiding themes of pre-Civil War Southern life—ruralism, cotton culture, extractive economics, slavery, developing political minority status in the nation. A general knowledge of American History is a *prerequisite.*

HST 580 History of the Labor Movement in the U.S. **3 credit hours**
After a brief survey of classic instances of early labor organization from the 1790's through the 1850's, a major attention is given to the conditions of labor in the post-Civil War United States and the movement toward national organization of labor. Thereafter, discussion turns to the economic, political, social, and intellectual emphases and programs of national labor organizations in the environment of late 19th century and 20th century United States.

HST 585 Science and Technology in American History **3 credit hours**
A descriptive and interpretative study of the role of American scientists, inventors, and technologists in American history from the colonial era to the present time, with particular emphasis upon the Machine Age. A general knowledge of American History is a *prerequisite.*

HST 590 Interpretations in American History **3 credit hours**
Specific topics will be chosen for investigation and interpretation as determined by the Instructor. The objective of the course is to assist High School teachers of American History in keeping abreast of the most recent literature in the field and to study new interpretations of historical events. A general knowledge of American History is a *prerequisite.*

HST 595 Seminar in American History **3 credit hours**
Students will examine selected topics in American History. Emphasis will be on discussion based on individual reading and interpretative essays.

HST 599 Thesis **3-6 credit hours**

MATHEMATICS (MTH)

Chairman: Dr. Kenneth C. Schraut

MTH 411 Probability and Statistics I **3 credit hours**
Prerequisite: MTH 202 or 218

MTH 412 Probability and Statistics II **3 credit hours**
Prerequisite: MTH 411

MTH 413 Probability and Statistics **3 credit hours**
Prerequisite: MTH 412

MTH 421 Advanced Calculus I **3 credit hours**
Prerequisite: MTH 202 or 218

MTH 422 Advanced Calculus II **3 credit hours**
Prerequisite: MTH 421

MTH 432 Fourier Series and Boundary Value Problems **3 credit hours**
Prerequisite: MTH 422

MTH 461 Introduction to the Theory of Functions of a Complete Variable **3 credit hours**
Prerequisite: MTH 422

MTH 465 Modern Operational Mathematics **3 credit hours**
Prerequisite: MTH 202 or 218

MTH 471 Topology **3 credit hours**
Prerequisite: MTH 422

The courses marked with an asterisk are intended primarily for graduate students in Education. Prerequisite for enrolling in any of these courses for graduate credit toward the M.S. in Education degree is standard teacher certification in Mathematics with at least 21 sem. hrs. in Mathematics.

***MTH 501-502 Fundamental Concepts of Algebra** **6 credit hours**

An introduction to the basic concepts of abstract algebra such as number postulates, groups, rings, fields, mappings, classes, and sets, as well as certain concepts taken from the classical theory of equations. An intensive study of the relation of these topics to the topics of high school algebra as proposed by the several curriculum revision groups.

***MTH 503-504 Fundamental Concepts of Geometry** **6 credit hours**

A study of the axioms and concepts upon which various geometries are built. A comparison is made between Euclidian metric and projective geometries and to a lesser extent consideration is given to non-Euclidian geometries. A comparison is also made between synthetic and analytic methods of proof with some consideration given to vector notations. An intensive study of the relation of these topics to the topics of high school geometry as proposed by the several curriculum revision groups.

***MTH 505-506 Fundamental Concepts of Probability and Statistics** **6 credit hours**

Topics to be discussed include: the basic laws of probability, frequency distribution (Binomial, Poisson, Normal, etc.) sampling estimation of parameters, sampling distributions, confidence intervals, tests of hypotheses, regression, and analysis of variance. An intensive study of the relation of these topics to the topics of high school probability and statistics as proposed by the several curriculum revision groups.

***MTH 507 Fundamental Concepts of Analysis** **3 credit hours**

This course will include the concepts of number, sequence, function, limit, continuity, derivative, integral, and infinite series, as well as their relation to the material in the high school curriculum.

***MTH 508 Introduction to Applied Analysis** **3 credit hours**

A survey of the application of differential equations and infinite series to classical problems in physics, science, and engineering.

***MTH 510 Theory and Practice of Computer Programming** **3 credit hours**

A study of the universal compilers agol and cobol, followed by a survey of the computer solution of selected problems taken from science, technology, and business. Attention will be given to the analysis of errors.

MTH 521-522 Real Variables I **3 credit hours each semester**

Sets and relations, cardinal numbers, order types and ordinals, the real number system and metric spaces, functions and sequences of functions.
Prerequisite: MTH 422.

MTH 525-526 Differential Equations **3 credit hours each semester**

Existence theorems and numerical methods. Linear equations and systems. Singularities. Asymptotic behavior and stability. Self adjoint differential systems and boundary value problems.

MTH 535 Partial Differential Equations I **3 credit hours**

Classification of partial differential equations, reduction to cononical form. Existence theorems and the generalized Cauchy problem. Methods of Solution, orthogonal functions, Green's Theorem, and operational methods.
Prerequisites: MTH 421, 461, *and preferably* MTH 465.

MTH 536 Partial Differential Equations II **3 credit hours**
The wave equation, Laplace's equation, some problems in the conduction of heat, motion of viscous fluids, the hodograph method. Numerical solutions and existence theorems related to these methods.
Prerequisite: MTH 535.

MTH 541-542 Operational Methods **3 credit hours each semester**
The operational methods frequently used in applied mathematics are studied including the Laplace and other Fourier transformations. The concept of involution is used to develop the theory. The inversion integral and applications to ordinary and partial differential equations are discussed.
Prerequisite: MTH 422, 461, *and preferably* 432 *and* 465.

MTH 545 Special Functions **3 credit hours**
The special functions frequently encountered in engineering and the physical sciences are studied. The hypergeometric function and generating functions are used throughout to develop the theory. The theory of infinite products and asymptotic expansions are also discussed.
Prerequisites: MTH 422 *and* 461.

MTH 551-552 Methods of Mathematical Physics **3 credit hours each semester**
Linear transformations and matrix theory. The series expansion of functions. Linear integral equations. The calculus of variations. Linear and non-linear oscillators, eigenvalue problems. Partial differential equations and potential theory. Functional transformations. Special functions.
Prerequisite: Consent of Instructor.

MTH 555-556 Advanced Numerical Analysis **3 credit hours each semester**
Harmonic analysis, data analysis, interpolation by orthogonal functions. Quadrature methods. Matrices and large scale linear systems. Concepts of convergent matrices, spectral radii, and spectral norms of matrices. Classical and modern iterative methods, including the successive overrelaxation method. Numerical solution of partial differential equations. Concepts of stability and convergence of numerical methods. Error analysis. Consideration will be given to programming the methods studied for a high speed digital computer.
Prerequisite: Consent of Instructor.

MTH 561 Abstract Algebra **3 credit hours**
Semi-groups and groups, groups with operators, integral domains and fields, extensions of rings and fields, elementary factorization theory, modules and ideals.
Prerequisite: MTH 361 *or equivalent.*

MTH 565-566 Linear Algebra and Matrices **3 credit hours each semester**
Vector spaces, linear transformations and matrices, determinants, equivalence relations, canonical forms, functions of vectors. Orthogonal and Unitary equivalence, structure of polynominal rings, equivalence of matrices over a ring similarity of matrices, linear inequalities.
Prerequisite: MTH 361 *or equivalent.*

MTH 571-572 Lineara Topological Spaces **3 credit hours each semester**
The study of various topologies within linear spaces, with emphasis on Branch and Hilbert Spaces. Review of Lebesgue integration. Orthogonal expansions. Projections. Linear transformations. Banach algebras and spectral theory.

MTH 575 Differential Geometry **3 credit hours**
Vector and tensor algebra. Covariant differentiation. An introduction to the classical theory of curves and surfaces treated by means of vector and tensor analysis.

MTH 599 Philosophical Foundations of Mathematics **3 credit hours**

The philosophical character of mathematical concepts. Nature, foundation and method of mathematics. The historical inter-relation of Philosophy and Mathematics from the Greeks to the present day.

May be replaced by PHL 505 Inter-Disciplinary Seminar.

PHILOSOPHY (PHL)

Chairman: Rev. Edmund L. Rhodes, S.M., S.T.L.

The courses below marked with an asterisk are intended primarily for graduate students in Education. Prerequisites for enrolling in any of these courses for credit in the M.S. in Education degree is the completion of the 12 sem. hrs. of basic undergraduate sequence in Philosophy courses.

These courses are also open to graduate students for the M.A. degree in Philosophy under conditions stated in this Bulletin concerning the use of advanced undergraduate courses open to graduate students.

***PHL 408 History of Modern Philosophy** **3 credit hours**

***PHL 410 History of Political Philosophy** **3 credit hours**

***PHL 430 Philosophy of Plato** **3 credit hours**

***PHL 432 Philosophy of Aristotle** **3 credit hours**

***PHL 434 St. Thomas Aquinas** **3 credit hours**

***PHL 450 Problems in Philosophy** **3 credit hours**

PHL 504 Philosophy of Art **3 credit hours**

An analysis of the nature of art, beauty, and the aesthetic judgment in the light of the philosophical principles and distinctive conditions found in each: a discussion of the permanent and inward relationship of the values of truth, goodness and beauty.

PHL 505 Inter-Disciplinary Seminar **3 credit hours**

Special emphasis to be given to the current interrelations of science, philosophy, the humanities, religion, education and government.

PHL 515 Methods of Research in Philosophy Seminar **3 credit hours**

The seminar aims to acquaint students with the methods, materials and tools special to and necessary for philosophical research.

PHL 525 Thomistic Texts and Commentaries **3 credit hours**

This course features carefully selected philosophical readings from the writings of Aquinas to be submitted to a critical analysis through the aid of commentaries, including a correlation to the primary Grecian, Neoplatonic, Patristic and Arabic historical sources. A reading knowledge of Latin is desirable.

PHL 540 Aristotle's De Anima and St. Thomas' Commentary **3 credit hours**

A comparative study relative to problems touching on the philosophy of man, as well as some problematics of human knowledge; but principally contrasting the animistic hylomorphism of Aristotle with the synolistic hylomorphism of Aquinas.

PHL 545 Modern French Philosophy **3 credit hours**

An examination of the leading philosophical movements in France with particular emphasis on the rationalism of Descartes, the spiritualistic realism of Bergson, the positivism of Comte, and the existentialism of contemporary philosophers.

PHL 555 Modern German Philosophy **3 credit hours**
A tracing of post-Kantian influences in modern Germanic philosophy through the idealistic developments of Fichte, Schelling and Hegel; stressing their "rationalistic" theological thought, their return to metaphysics and their varying intellectual intuitionisms.

PHL 560 Modern British Philosophy **3 credit hours**
A survey of the 17th and 18th century reactionary and transitional empiricists from Bacon and Hobbes through Locke, Berkeley and Hume. Points of stress include: (1) their psychologico-epistemological approach to experience and fact; (2) their relation to positivism; (3) a critique of ideas, the value of knowledge, the notion of substance, causality and realism.

PHL 565 The History and Literature of American Philosophy **3 credit hours**
A survey of the major trends and issues of American thought from the 18th century to the present, especially as reflected in the writings of Edwards, Jefferson, Emerson; Royce, Peirce, James, Dewey, and Santayana. The development of democratic traditions; transcendentialism; the significance of recent European importation.

PHL 570 Existentialist Philosophy **3 credit hours**
A penetrating study of the existentialist movement, its nature and causes, along with a survey of the position of some of the outstanding existentialists, such as Kierkegaard, Sartre, Jaspers, Heidegger, and Marcel.

PHYSICS (PHY)

Chairman: Dr. Joseph Kepes

Prerequisite for enrolling in any of these courses for graduate credit toward the M.S. in Education degree is the completion of undergraduate requirements for standard teacher certification in Physics or in Physical Science plus the completion of one year of college mathematics.

PHY 351 Introduction to Astronomy **3 credit hours**
Prerequisites: MTH 202 Differential and Integral Calculus II, and PHY 206, 207, 208 General Physics.

PHY 420 Introduction to Solid State **3 credit hours**
Prerequisite: PHY 311.

PHY 440 X-Rays **3 credit hours**
Prerequisites: MTH 218, PHY 206, 207, 208. *Recommended previous course:* PHY 311.

PHY 450 Advanced Astronomy **3 credit hours**
Prerequisite: PHY 351 Introduction to Astronomy.

PHY 500 Modern Physics I **3 credit hours**
The object of the course is to familiarize high school science teachers with some of the current advances in physics. The great present day interest in atomic and nuclear physics stems both from the basic nature of the problems attacked and from the technical applications, which are world in importance. An understanding of the foundations of the subject, together with some of the chief results and trends, is a necessity for high school teachers of science.

PHY 500L Modern Physics Lab I **2 credit hours**
A laboratory course intended to allow the student to perform experiments discussed in the lecture, to measure fundamental particles, charges, and constants, both modern and classical.

PHY 501 Modern Physics II **3 credit hours**
A continuation of PHY 500. Modern Physics I.

PHY 501L Modern Physics Lab II **2 credit hours**
A continuation of PHY 500L. Modern Physics Lab. I

PHY 505 Modern Physics for Engineers **3 credit hours**
Selected topics in atomic physics, the solid state, and nuclear physics. Elementary quantum mechanics and application to the free-particle and the one-electron atom. X-Rays, elementary particles, cosmic rays will also be studied to some extent.

PSYCHOLOGY (PSY)

Chairman: Dr. Joseph J. Moylan

PSY 307 Psychology of Exceptional Children **3 credit hours**

PSY 312 Abnormal Psychology **3 credit hours**
Prerequisite: PSY 305 Mental Hygiene, *or equivalent.*

PSY 401 Advanced Statistics **3 credit hours**
Prerequisite: PSY 302 Elementary Statistics, *or* EDU 503.

PSY 408 Social Psychology **3 credit hours**
Prerequisites: Six hours of Psychology *or* Educational Psychology.

PSY 420 Industrial Psychology **3 credit hours**
Prerequisites: PSY 302 *or* EDU 503.

THEOLOGY (THL)

Chairman: Rev. Matthew F. Kohmescher, S.M., S.T.D.

Any of the 400 level undergraduate courses in Theology (except Thl 406, 407, and 408) may count for graduate credit under the usual conditions. Prerequisite for enrolling in any of the following courses for graduate credit toward the M.S. in Education degree is completion of the undergraduate sequence of Theology and Philosophy courses, namely 12 sem. hours in Theology and 12 sem. hours in Philosophy, or the equivalent.

THL 500 Philosophy of Religion **3 credit hours**
A systematic interpretation of the essential bond that unites man to God in a real relation of the creature and the Creator; a Christian philosophic approach to this personal social relationship in the dimension of immanence and transcendence; and exposition of the sacred and eternal in the human and divine society effected by faith and love in the human being made to the image and likeness of God.

THL 501 History of Religion **3 credit hours**
The comparative role of Christianity and non-Christian religions in the molding of world civilization and, in particular, in the Western culture. Among all religions, the unique doctrinal, moral, and liturgical features of Christianity, with special investigation of their processive incarnational character.

THL 505 Theology of the Incarnation **3 credit hours**
An appreciative study of the Incarnation of the Word of God divinely revealed in Sacred Scriptures and Tradition as the pivotal truth of Christianity, together with its doctrinal developments and precisions necessitated by the key Christological controversies of the patristic, medieval, and contemporary eras, as well as its consequent influence on Christian life and practice during these same periods.

THL 520 Role of the Mother of God in the Incarnation **3 credit hours**
The Divine Maternity, principle of Mary's excellence; the spiritual maternity:

the meaning of the doctrine, pronouncements of the Magisterium, the evidence from Scripture, the voice of Tradition, the theological explanation; relation to other privileges, special questions of the 19th and 20th century authors. The Universal Mediation of Mary.
Prerequisite: THL 342.

THL 521 Privileges of the Blessed Virgin **3 credit hours**
The Immaculate conception: defined doctrine, proof from Sacred Scripture, argument from Tradition, proof from theological reason, alleged debt of sin in Mary, immunity from concupiscence, consequences, greatness of the privilege; the Assumption: (1) Our Lady's Death, adversaries, proof of the thesis, question of Mary's death after Munificentissimus Deus; (2) The Assumption itself: Catholic dogma, errors, proofs from the Magisterium, Scripture, Tradition, Liturgy, Connection with other truths.
Prerequisite: THL 444.

THL 522 History of Mariology **3 credit hours**
An historical treatment of the principal ideas in the Mariological treatise in order to see the development of dogma and theological doctrine from the time of the Fathers of the Church to the present era. Special emphasis will be given to the doctrines of the spiritual maternity and the coredemption.

THL 540 The Church of Christ **3 credit hours**
Institution and Organization of the Church of Christ. Functions and characteristics of the Church. The hierarchy and the Roman Pontiff. The Church as the Mystical Body of Christ.

THL 541 Church and State **3 credit hours**
A definition of the problem in terms of institutions; its historical perspectives with emphasis on its contemporary significance. A presentation of the basic elements involved in any solution of the problem.

THL 542 The Catholic Church in America **3 credit hours**
An intensive study of the history, structure and regional diversity of the Church in our pluralistic society and a consideration of the widening impact of the Church on the national community in areas vital both to the United States and the supernatural mission of the Mystical Body in our country.

THL 543 Missiology: The Missionary Movement in the Church **3 credit hours**
An intensive study of the nature of the Church's mission and its implementation throughout the course of history, with special emphasis on the latest developments, particularly on the increasingly vital role that the laity are to play in the missionary conquests of the Church.

THL 544 Theological Perspectives of the Apostolate **3 credit hours**
A dynamic study of Christian social morality in the light of the mission of the Church; the mystery of the Church; the role of Christ the King; apostolic life in Christ; apostolic purifications and temptations; the exigencies of the missionary spirit.

THL 545 Canon Law for the Laity **3 credit hours**
A consideration of those points in the official law of the Church which are of great practical importance in the life of the layman.

THL 590 Seminar with monograph **3 credit hours**

THL 599 Thesis **3 credit hours**

The University of Dayton
(Main Campus)

1. FIELD HOUSE
2. ALBERT EMANUEL LIBRARY
3. FACULTY-STAFF PARKING
4. MUSIC BUILDING AND GIRLS GYMNASIUM
5. ST. MARY'S HALL
6. CHAMINADE HALL
7. CHAPEL
8. ST. JOSEPH'S HALL
9. STADIUM
10. RELIGION BUILDING
11. ALUMNI HALL
12. FOUNDERS HALL
13. ROTC BUILDING
14. MECHANICAL ENGINEERING BUILDING
15. STUDENT UNION
16. RESEARCH ANNEX
17. WOHLLEBEN HALL
18. SHERMAN HALL
19. OBSERVATORY
20. WOMEN'S RESIDENCE HALL
21. CAFETERIA FACILITY